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THE

GLASGOW MEDICAL JOURNAL.

THE
GLASGOW MEDICAL JOURNAL.

EDITED BY

JOSEPH COATS, M.D.,

FOR THE

Glasgow and West of Scotland Medical Association.

JULY TO DECEMBER 1880.

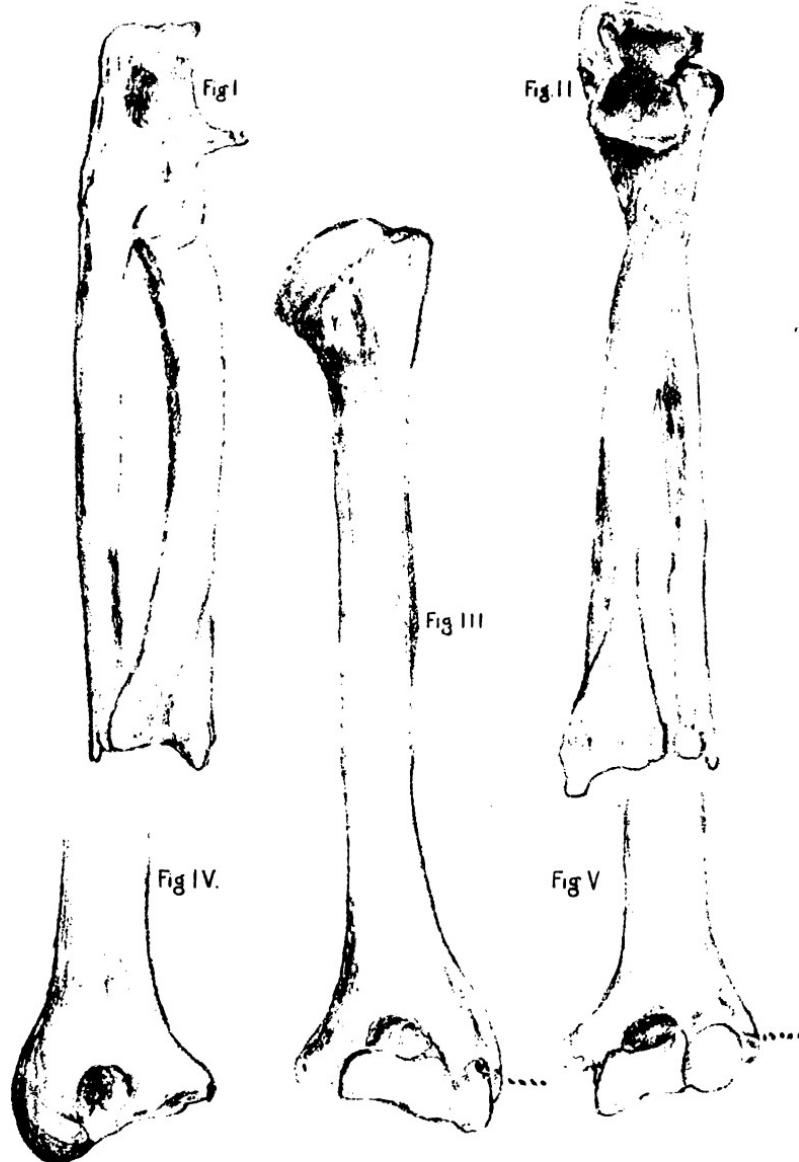
VOL. XIV.

GLASGOW :

ALEX. MACDOUGALL, 66 MITCHELL STREET.

LONDON : H. K. LEWIS, 136 GOWER STREET.

1880.



THE
GLASGOW MEDICAL JOURNAL.

No. VII. JULY, 1880.

ORIGINAL ARTICLES.

HYPERTROPHY OF THE PROSTATE GLAND AND
ITS TREATMENT.

Being Summary of a Paper read before the Medico-Chirurgical Society of Glasgow on 16th April, 1880.

By GEORGE H. B. MACLEOD,

Regius Professor of Surgery, University of Glasgow ; Surgeon and Lecturer on Clinical Surgery to the Western Infirmary ; and Surgeon in Ordinary to the Queen in Scotland.

IN a recent discussion on Stricture of the Urethra, the treatment of retention of urine from enlargement of the prostate gland was alluded to, but not discussed. The interest shown by various members of the Society regarding that important affection has led me to bring it before you on this occasion in a separate form.

Probably every member of this Society has had some experience in the treatment of hypertrophy of the prostate, at least of the lesser degrees of it ; and some I know (from having been associated with them in their management), have had to do with its more anxious and advanced stages. Of the slighter degrees of the affection—those met with in almost every day practice—I do not desire to speak. Of these I have seen but few for some years, but of the serious cases—those in which catheterism has become difficult, and in which complications have arisen—I have seen many, and it is on them that I now desire chiefly to comment.

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To render the subject more clear, I must recall several anatomical and pathological facts, with which some of you are doubtless already acquainted.

Hypertrophy of the prostate is, I need hardly say, very common, though it is not a necessary condition of old age, as was long erroneously supposed. It is no doubt true that this gland is only rudimental in children, little developed till puberty, and frequently enlarged in men over sixty years of age, yet its notable increase is certainly not a necessary accompaniment of old age. It must be within the experience of most practitioners that some extremely old men do not suffer from it, while others, by no means advanced in years, and who present no other appreciable senile change, are affected with it.

Observation has also disproved the frequently repeated statement that sedentary employments predispose to it, but no exciting cause has, as yet, been clearly recognised as producing it. Augmented nutrition, from increased blood supply, must be the essential cause, but what attracts that hyperæmia is not always easily traced. Doubtless, the position and connections of the gland render it, in a great measure, liable to congestion. It is well known that a large network of veins covers the sides and base of the gland, and that these are liable to varix. Chronic constipation—such conditions of the abdominal organs as retard the current in the iliac veins (into which a large amount of the blood from the prostate empties itself)—chronic inflammation, or repeated attacks of inflammation, will all induce conditions favourable to the establishment of the disease.

I had in the Western Infirmary, this winter, a patient aged 46, who had the symptoms of chronic enlargement of the prostate well marked. He had suffered from repeated and prolonged attacks of chronic urethritis, with swelled testes (showing that the irritation had penetrated to the back of the canal), and he was very intemperate as well.

The affection under consideration is a combination of "simple" and "numerical" hypertrophy,—the elements of which it is composed, viz., unstriped muscular fibre, connective tissue, and, in a lesser degree, its glandular elements being both increased in the number of their atoms and augmented in their bulk.

Like all such changes, the enlargement of the prostate takes place, as a rule, very slowly, and its rate of progression is neither steady nor continuous. It often affects one lobe more than the other, and thus deflects the canal which traverses it.

Very little of the prostate gland lies above the urethra—text books to the contrary notwithstanding. It is at the sides and below, *i.e.*, towards the rectum, that the gland chiefly lies, and when it enlarges the canal is pushed upwards, and rendered narrower, though considerably longer than usual. The hypertrophied portion enlarging towards the bladder may come to project into that cavity, and if it is pressed back towards the opening of the urethra it may form a very complete valve.

The size which the prostate may attain is very great indeed, being easily recognised, not merely from the rectum, but in thin persons, by deep pressure above the pubis. In a patient admitted into the Western Infirmary, three years ago, it seemed to fill the hollow of the sacrum.

The enlargement of the gland, as is well known, affects its central, as well as its lateral portion, and comes to produce very embarrassing effects on micturition. That it should induce retention in many cases is easily understood; but that the opposite condition of incontinence should also occasionally follow, is not at first sight so easily explained. This anomaly is caused by the wedge-like action of this "third lobe" preventing the close contact of the lateral portions at the upper corners of the orifice. It is well understood that the urethra may be laterally or horizontally deflected, and even rendered tortuous by the unequal development of the different portions of the gland. If I also remind you that muscular tumours, similar to those which grow in the uterus, occur not rarely in the prostate, we have before us abundant reasons why the urinary canal, at its vesical end, should be frequently altered in its direction and calibre. I may add, that the venous plexus before alluded to gives, if wounded, very ready and direct access to the general system to any putrid matter brought into contact with it.

As to the urethra, let me remind you that anterior to the triangular ligament (Colles' "suspensory ligament of the urethra") the canal is so perfectly pliant that it can be made to assume any relationship to the parts behind that ligament. The limit of this anterior portion is the sinus of the bulb. As the canal passes below the pubis it forms an obtuse or open angle which looks backwards and upwards, and it continues to rise slightly to its point of entrance into the bladder. The angle thus formed below the pubis can be considerably diminished by traction on the pendulous portion of the penis, but the part behind the ligament, *i.e.*, the membranous and prostatic portions, are but little affected by such manipulation. The inner end of the curve, *i.e.*, the vesical orifice of the canal, can

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be raised and the curve augmented by pushing up the prostate from the rectum; while the reverse effect can be obtained by hooking down the bowel towards the coccyx by the finger, a manœuvre which materially straightens the urethra and has an obvious bearing on the subject of this paper.

The vesical orifice of the urethra lies on a plane passing from the lower part of the symphysis to the coccyx. A long needle passed directly backwards from the lower surface of the symphysis to the sacrum usually lies above the opening of the canal. This is not what is usually represented.

From what has been said, it follows that a straight instrument can be readily passed into the bladder, if the pendulous portion of the penis be held at right angles to the axis of the body, and that if a sound with a large curve is employed the penis must be laid close to the abdomen.

The anatomical fact, so much dwelt upon by Guyon, that a firm fibrous band so constricts the urethra at the sinus of the bulb as practically to divide the canal into two portions, suggests several important pathological considerations. The point of constriction is the narrowest part of the canal after the meatus, and is little capable of dilatation. It has been termed the "sphincter of the urethra" by Amussat, and the "collar of the urethra" by others. It is readily recognised in the dead subject by examination made from the vesical end of the canal. It forms one of the great obstacles to catheterism. It is a temporary barrier to the backward spread of inflammation, and efficiently prevents the passage of injections thrown in by the meatus. If inflammation passes that point it will be difficult to eradicate, while irritation of the seminal ducts, and even desquamation of the mucous membrane in the prostatic region and neck of the bladder—conditions which prove obstinate and troublesome—become established. There, too, calculi are apt to stick and fistulous openings to form.

Let me remind you, also, that the muscles of the urethra proper, together with the "pubio-urethral," or Wilson's muscle, keep the walls of the membranous portion of the urethra, when it is empty, in close contact, and in this way oppose the escape of the urine. They have been from this action called the true sphincter of the bladder. When in action they can expel the last drops of fluid, serving to produce a *coup-de-piston* by which the passage is cleared.

The prostatic urethra is thus closed at either end, by the sphincter of the bladder, properly so called, and the muscles just alluded to.

In this way, if that portion of the canal becomes dilated,

urine or semen may be shut up within it. A very considerable reservoir or receptacle may be thus formed in the prostatic urethra, which, when emptied by the catheter, has been sufficiently great to make it appear as if the bladder had been reached.

That the muscles of the membranous urethra may, if spasmodically contracted occlude the canal, no one who has seen much of practice can doubt. It is certainly true that, as a rule, what is called "spasmodic stricture" is a complication of "organic stricture," but that it occasionally occurs as an independent condition I am convinced from clinical observation. The existence of cadaveric contraction in these muscles, and its dissipation by the passage of a sound, is familiar to those accustomed to the examination of the dead.

It must be consonant with the experience of every practitioner that, when a healthy, strong, and muscular patient voluntarily strains on the passing of a bougie, it is arrested and firmly caught in the membranous urethra. If it is let alone it will be ejected, but if we divert the patient's attention, the obstacle disappears and the instrument glides on. A catheter is occasionally stopped at the very neck of the bladder, apparently from the voluntary contraction of the sphincter. By preventing the occurrence of these obstacles chloroform greatly facilitates the passage of instruments. It is, I hope, unnecessary for me to apologise for having mentioned these details as introductory to my subsequent remarks.

When the prostate is hypertrophied, retention may become established very suddenly, and not always from any very apparent cause. The inability to pass urine may be the first intimation that the patient receives of the prostatic affection, but more usually it is the climax of a long threatening condition.

The stream of urine has been for some time—possibly for a long time—becoming feebler and slower. It takes a longer time to begin and is difficult to complete, as a certain quantity of urine lodges in the passage and escapes, soiling the clothes, after micturition is supposed to be completed. There is not, as an Irishman once expressed it to me, the same "satisfaction" in the act. The usual exciting cause of the retention is, however, in most cases, to be traced to some undue exposure to cold or fatigue—too long retention, as during a railway journey; prolonged constipation; some excess at table; and above all, intemperance. We have all seen illustrations of these exciting causes. In cities it is probably a bout of drinking that most frequently acts as the *coup-de-grace*.

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Former attacks of urethritis and subsequent intemperance are common conspiring causes.

The occurrence of acute congestion is, no doubt, the immediate cause of the retention, and this must be kept in mind at all stages of the treatment, as the augmented vascularity of the gland renders wounds and injuries more dangerous.

It is no part of my intention to recount the signs by which we recognise hypertrophy of the prostate. They are generally well known, but the curious thing is that, in practice, they are so often confounded with those indicative of stone and stricture.

The frequent calls to micturate,—the difficulty which attends the act,—the straining and pain,—the sudden stoppage and resumption of the stream,—the piles and congestion of the rectum, &c., &c., suggest doubt, and perhaps a satisfactory examination is not allowed by the patient. Stone, too, is not infrequently combined with hypertrophy, and is in a great measure due to it.

The imprisoned and altered urine readily deposits its salts, and, as their escape is prevented, they concrete into calculi. My remarks at present, however, do not embrace these complicated cases. The age of the patient,—the history of the attack,—the point at which the catheter is arrested, and the examination of the gland from the rectum will differentiate it from stricture. In hypertrophy the stream, too, on enquiry, will be found to be feeble, but not actually diminished in volume as it is in stricture.

From stone hypertrophy can be distinguished by the occurrence in the former of small discharges of florid blood after exercise,—by the pain at the glans penis after micturition,—by the quality of the urine being less altered,—by there being less irritation and disturbance at night, and above all, by the use of the sound. In both, however, there may be a sudden pause in the stream as it is passed.

From villous growths at the neck of the bladder, hypertrophy may be diagnosed by the profuse bleeding which these growths occasion; by the exquisite pain caused by the catheter, and the debris which is expelled.

Malignant growths make rapid progress, and the lymphatic glands give evidence of infiltration.

I need not allude to mere atony of the bladder, as a rectal examination and attention to the flow of the urine through the catheter will distinguish them; nor yet is it necessary to speak of paralysis of the bladder, which will be accompanied

by a similar state in other parts; but there is a rare and curious affection which produces symptoms so like those of hypertrophy that I must refer to it, and this I do the more readily as I have seen some very typical examples. I allude to those valves at the neck of the bladder which have been so carefully studied by Mercier and others, and which tend to produce ulterior mischief in the bladder and kidneys in all respects similar to that which follows hypertrophy. These valves are occasionally quite thin when composed of mucous membrane alone, but they are sometimes thick and resistant, containing connective and fibrous tissue, and then not only impede the escape of the urine, but render the passage of an instrument very difficult. I cannot do better than relate the history of a patient who, I believe, suffers from this affection, and whose condition I have watched for several years. He is a pale and delicate looking man, an artist by profession, and aged 27. He cannot recollect the outset of his ailment. His attacks are not quite so frequent now as they were some years ago, as he has learned to manage himself, and while he is at times almost free from his ailment, he has periods of exacerbation which he cannot always ascribe to any cause. His symptoms consist of irritability of the bladder, with pain during the act of micturition, which, beginning at the neck of the bladder, flashes along to the meatus. During the attack he has frequent calls to make water, sometimes great difficulty in the act, and a feeling as if his bladder was not completely emptied. He strains much—so much as frequently to defæcate, and he has suffered from piles and even protrusion of the bowel. Experience has taught him to resist this straining, and that by lying on his back or reclining, and "letting it come," he best gets the relief he desires. The stream is occasionally small and twisted, and may cease suddenly, but more usually it is unaffected unless the spasm is great. He is subject to seminal emissions, and had become quite "hipped" when I first saw him by the mental depression produced by his ailment. He was in constant dread of an attack, and especially of complete retention coming on, as this had several times caused him much suffering.

It was supposed by those who had treated him before he came under my observation that he suffered from calculus, and various unsuccessful attempts had been made to sound him. The use of any instrument had always been followed by profuse bleeding and so much pain as to render him seriously ill. My conviction was, from his own account of the proceedings, that no instrument had ever entered his bladder.

It was after an aggravated attack that he first called for me, and he stated very emphatically that he thought that there was some sort of growth at the bladder-end of the passage which fell against and closed the orifice. I put him under chloroform, and examined him very carefully with a short-beaked instrument. The prostate was normal in size and consistency. He told me that, when the finger was passed into the rectum on previous occasions (when he was not under chloroform), it was very tender to pressure. I found the bougie pass easily till it reached the neck of the bladder, and was just on the verge of entering that organ, and there it was abruptly arrested by a resistant wall which seemed to meet it right across the canal. The least pressure brought blood. The finger in the rectum easily detected the point of the instrument close up to the vesical orifice. By raising the point slowly it suddenly slipped over the barrier and entered the bladder.

In withdrawing the instrument, a similar sudden movement, but in the reverse direction, took place. This I repeated several times, so that I came to pass an instrument with little difficulty. It always appeared to slip quickly over the edge of a thin membrane, and this feeling the patient was himself conscious of, when on a subsequent occasion I repeated it without chloroform. It then gave him considerable pain. He had no stone, and I taught him to pass a "sonde coude" without much difficulty, as he lay on his back in bed. Beyond this, and explaining to him the nature of his affection, I did nothing for him. He has been able to ward off the more aggravated attacks, and the evidence in favour of operative interference, as has been proposed in such cases, did not appear to me to warrant any attempt at a radical cure.

In another case, which I first saw with the late Dr. Andrew Anderson, and afterwards on one occasion with Dr. Henderson, the valve had been ruptured by a surgeon in London, who had been called in to see him during an attack of retention following the railway journey to town. He had bled profusely, and suffered great pain. The flap-like remains of the valve could be made out when a catheter was passed and the finger placed in the rectum.

A third case I lately had an opportunity of showing to my clinical class at the hospital. The distinctive characters of this affection are the early period at which it shows itself—the unchanged condition of the prostate as examined from the rectum—the place at which the instrument is arrested, and the sudden jump which it makes over the barrier when it is gently

raised, and the as sudden descent as it returns. If a short-beaked instrument is used, it can, by turning the point downwards after it has entered the bladder, be made to hook itself on the valve. If coincidently with this valve the third lobe was developed, a very complete barrier to the emission of urine would be established.

But to return: What treatment does true hypertrophy demand? Doubtless, you would reply, a careful use of the catheter, so as to keep the bladder free from residual urine, and to attend to the general health. It is true this is quite sufficient in the majority of cases, but it is not, as I have already said, to these ordinary cases that I wish at this time to refer, but to those severe and difficult ones which have almost solely come under my attention of late years.

In all these cases the catheter could not be passed by the regular attendant. It would be of little service to record individual cases. Some of them I know have been in the hands of gentlemen here present. Their features are very much the same. Old men suffering from hypertrophy of longer or shorter duration finally ending in retention; repeated attempts, often by several surgeons, to pass a catheter, and the establishment of a most serious condition due to the profuse bleeding induced, the great pain, and the poisoned state of the blood, arising partly from uremia and partly from the absorption of putrid elements by the vessels in the wounded prostate. In dealing with these cases, the chief harm is done at the outset by the medical man first called. I might classify the mistakes apt to be made as follows:—First and before all, force has been used; secondly, an unfit instrument has been employed; third, the patient has been placed in a bad position when the attempt to pass the catheter was made; fourth, a catheter has been at once employed when it would have been better to have premised other measures; fifth, the attempt to pass the instrument has been persevered in too long; sixth, chloroform has not been given when the difficulty was found unusually great.

When called to treat such a case, the practitioner should consider carefully whether a catheter is really demanded at the moment—whether it would not be well to diminish or remove those temporary conditions (congestion) which have occasioned the retention, before he risks irritating the passage, and possibly augmenting the determining cause of the complication present.

Do not misunderstand me. If I myself were called to such a case, I would have recourse to the catheter at once, but from

the necessity of my position I have become accustomed to employ it, and know from past experience the danger of using it carelessly. Those who have had much experience of catheterism *in such cases* would certainly be justified in having recourse to it, but that is not the question I wish to discuss. It is not what should be the practice of a hospital surgeon that I am endeavouring to explain, but what ought to be done by the general run of medical practitioners.

I am confident that, if the case is not very pressing, and the catheter can be delayed till other measures have been employed to prepare for it, much injury would be often escaped. In the hands of most practitioners, I say it very advisedly, the catheter is a most dangerous weapon.

There is local congestion present in these cases, and it must be subdued. But how is this best done? A hot bath; elevation of the pelvis; many leeches to the anus and perineum (which is better than local cupping or bleeding from the arm); a purgative clyster, followed by a small enema of starch and laudanum form our best resources. If these measures fail, then chloroform; hooking the bowel with the finger well towards the coccyx, and pressing gently on the abdomen. If this fail, then, while he is still under chloroform, passing the catheter, but how? In addition to the usual rules, followed in all cases, of elevating the pelvis by putting a pillow under the buttocks, using a full sized instrument, and keeping its point gently along the upper surface of the canal, we must remember the increased elevation of the vesical end of the urethra, and while *gently* following it, raise the point of the instrument by pressure behind the scrotum, *i. e.*, on the perineum, and by pulling down the bowel. It is a most important thing to withdraw the instrument a little the moment it comes in contact with the gland, and then, *but not sooner*, to depress the handle considerably. One of the most common errors is depressing the handle too soon. If traction is made on the penis, *i. e.*, if that organ is kept well stretched on the instrument, the catheter will pass readily, and with but little depression of the handle, up to the prostate, then, if having touched the gland lightly, the point is raised by slowly depressing the handle (the point being in close contact with, *but not pressed into the gland*), it cannot fail to enter the bladder.* It is in the raising of the point over the gland that the “sonde coudé” of Mercier is of so much service.

* If the instrument is deflected to one side or other by the distorted direction of the canal, so long as it goes gently on, it should be allowed to follow its own inclination.

It was introduced here by me a good many years ago, and I have done my best to let its merits be known, both in the hospital and in private practice. If it is well lubricated, and held so that the point will look to the left side till it has passed the triangular ligament, and then, by a half turn, bringing the point in contact with the upper surface of the canal, it is passed with amazing readiness. I have frequently seen it glide without the sensation of a hitch when the usual instrument has failed. Nothing astonishes a man more than the facility of its introduction, in the cases now under consideration, over the ordinary catheter.

I have been, however, unable to discover any advantage in the "bi-coudé," which soon loses its second angle. Here is the instrument, as well as a leaden one with the same curve, in which the weight seems to help the introduction. Most practitioners have notions of large curved instruments, and of raising the point by withdrawing the stylet if an elastic catheter is used. If this "sonde coudé" is once employed by you, I do not think that you will ever try another. It is many a day since I have discarded big curved and extra long catheters from my own practice.

I repeat the advice I have already given—never to use violence or force. If the instrument hitch on anything, withdraw it slightly and go on again. Use a large instrument—the largest which will pass the meatus. One of the chief evils which arises from confusing this affection with stricture is the employing of small catheters in dealing with enlarged prostate. False passages and wounds of the gland are almost certain to result. A soft vulcanite instrument will often screw in in ordinary cases, but not in the bad ones, to which my present remarks refer.

If no passage is found in the middle line, gently try either side and the upper angle, where the contact of the middle with the lateral lobes is less close. If the instrument is held lightly (as it should always be), and has some weight, it will turn to one side or the other of its own accord, following the direction of the canal—the handle turning, of course, towards the side on which the lobe of greatest size lies.

If these plans fail, *as they very seldom do*, then other methods may be tried. One plan is to inject with force a current of water through the catheter after it has been pushed up to the gland. Such current will open the passage and allow the instrument to be pushed gently on with or without the aid of the finger introduced into the rectum.

"Catheterisme-a-la-suite" is the term applied by the French

to another manœuvre, to which I have never had recourse, but which is said to have proved useful in difficult cases. A catheter open at both ends is guided into the bladder by means of a strong thread passed through its interior, and which is attached to a small elastic bougie, which is pushed on before. The bougie readily finds its way into the bladder, and the catheter, guided by the thread, is made to pass over it.

If, notwithstanding every care, the prostate has been wounded, and there is considerable bleeding, and the distended bladder has not been relieved, all further attempts should be given up and the aspirator passed above the pubis. This, I apprehend, would be the right practice, though I have never required to follow it. It is the boring at the gland, the wounding of its dilated or congested vessels, and the absorption of decomposing urine and blood which induces that poisoning which proves so frequently fatal. I need hardly say that, now-a-days, all tunneling of the prostate for retention has been abandoned.

When an instrument has been lodged in the bladder with difficulty, there is great inducement to tie it in, and while sometimes this practice does no harm, it usually occasions great uneasiness, if it does not do worse by setting up inflammation in the neck and body of the bladder, and so augmenting the danger. I have known it, however, prove very useful, and apparently produce a great increase in the quantity of urine secreted. I do not think that any winged, twisted, or bulbous instrument is fitted for these cases, as they are more difficult to introduce and withdraw, and tend to become encrusted with phosphates.

If the prostate has been much wounded and the canal become irritable, the case is very critical, and it would probably prove the less dangerous practice to make a clean cut into the bladder, as in median lithotomy, or to open the perineum and lodge a vulcanite catheter in the bladder—in either case securing good drainage. I am sure that in some cases, if this were promptly done, and the kidneys were sound, much suffering and some valuable lives would be saved.

A suggestion lately made by Sir Henry Thompson, of introducing a permanent tube above the pubis, so as to give rest to the neck of the bladder, has been repeatedly mentioned by me (I have no doubt in the hearing of many of you) in clinical teaching during the last ten years, and many years ago I had a tube made which I thought well fitted for the purpose, but

never having had occasion to use it, I did not consider myself justified in publishing the suggestion.

But to return—after having got command of the bladder we must keep it clear, and occasionally wash it out so as to remove all sediment. Beyond this, the management of these cases, in my opinion, is summed up in the one word “support.”

Nourishing, easily digested food, in small and frequent quantities—no stimulants, unless to combat pressing exhaustion—plenty of diluents, to keep the urine unirritating—enemata, to prevent constipation and consequent congestion—quinine in free doses, to overcome the typhoid condition so commonly present—keeping the pelvis raised and the body warm, constitute the chief indications for the subsequent treatment.

Stimulants, as a rule, are too freely administered. They increase the irritating qualities of the urine, and they excite, and tend, in the long run, to exhaust the patient. Their use must, then, be very carefully and intelligently watched, in order to get good, and no evil, from their use.

On the use of chloroform, in dealing with these cases, I could say much, and illustrate it copiously, from my own experience, but I refrain, from the length to which my remarks have already extended.

By using an anaesthetic the patient is saved much pain and exhaustion, and the surgeon allowed to be much more deliberate and careful in his manipulation.

On that troublesome and, in some cases, dangerous intermittent “urethral fever,” which one sees so much of after catheterism, without chloroform, I should have been glad to make some remarks. That in many cases it is really due to blood-poisoning, I have little doubt, but in other cases it appears to be the result of an impression on the nervous system alone. Aconite is credited with much influence over these attacks, but of its effects I cannot speak from personal experience. Chloroform, gentleness, and quinine are, in my experience, the true remedies.

Patients who have once suffered from retention in connection with hypertrophy of the prostate gland must be most careful during all their subsequent lives. Their habits of living as regards food and stimulants; exposure to cold; the action of the bowels; the emptying of the bladder at short intervals; the keeping of the body warm (especially the pelvis and feet), the pursuit of exercise in good weather without causing exhaustion, and acquiring the art of passing the catheter, so as once or twice a week thoroughly to clear the

bladder of all residual urine, constitute the more prominent and important particulars.

It may be taken as established that no internal or external remedy will affect the reduction of an hypertrophied prostate, though temporary congestion may be warded off or subdued; and, further, that no operation such as compression, crushing, ligature, excision, or other step is justified so long as life can be rendered bearable by less violent and dangerous measures.

PRACTICAL PAPERS ON THE MATERIALS OF THE ANTISEPTIC METHOD OF TREATMENT.

BY GEORGE BEATSON, B.A. (Cantab.), M.D. (Edinb.)

V.—ON THE CARBOLISED CATGUT.

(*With two Woodcuts.*)

IN the present paper I propose to consider the *carbolised catgut*, one of the most important of the antiseptic materials in use in Lister's system, and the introduction of which into surgical practice, on the principles laid down by that surgeon, constitutes one of the most remarkable advances of modern surgery, while it is to my mind, at the same time, one of the great triumphs of Lister's antiseptic system, for the same material had on many occasions been tried under the old *régime* and found wanting. Indeed, an account of the investigations which led to its adoption by Mr. Lister would prove most instructive reading, and I would have been glad, did space allow, to have gone fully into them; but I must content myself with saying that a record of them is to be found in the *Lancet* for April 1869, and that it will well repay perusal. Meanwhile, as carbolised catgut, although put to several uses in Lister's system, is chiefly employed as a ligature to arrest haemorrhage, I think it will be as well to direct my remarks almost entirely to its employment in that capacity, not omitting, however, a brief reference to those other uses in which it has been found not only advantageous, but even vastly superior to any other material.

The Carbolised Catgut Ligature.—There are so many points in connection with this substance that require attention, that I think it advisable to group my remarks under several heads,

and in this way to render clearer many facts of great surgical interest and importance. Accordingly, I shall first speak of the source of supply of the catgut, of the proper mode of carbolising it, and of the method of applying it as a ligature; and then I shall recount what is at present known as to the influence of the tissues on it in aseptic and septic wounds respectively, together with a statement of the practical lessons which this knowledge teaches, and I shall conclude by a brief reference to the various other uses to which carbolised catgut may be put in addition to its employment as a ligature.

1. *The Source of its Supply.*—The word *catgut* clearly indicates that the material to which it is applied was formerly made from the intestines of the cat, but this is no longer the case, and the term is therefore really a misnomer, for the strings of considerable toughness and tenacity which now pass under the name are obtained chiefly from the intestines of sheep and lambs. It is from these animals that we get the so-called catgut ligatures used in surgical practice. The steps of the process are as follows. The intestines are taken warm from the animal, and after being freed from all feculent matter and fat, they are soaked for some hours in water. When they are sufficiently steeped, their external covering is removed by placing them on a sloping board and scraping them either with the back of a knife or other suitable instrument. This is followed by another steeping in water, and they are alternately scraped and soaked until they are completely purified, when they are placed for two or three hours in a weak solution of potash, with a view of still further cleansing them. This done, the large intestine is cut off, to be utilised for special purposes, chief among which is that of forming coverings for sausages, while the small intestines, after being rendered smooth by passing through a perforated piece of brass, are laid by for making catgut threads or cords. This is accomplished by thoroughly drying them in the sun or in hot air, then cutting them into the different sizes, and rounding them smooth by passing them through the holes of a machine made specially for the purpose, and not unlike a perforated thimble. The threads are now quite ready for use, but in order to whiten them and also free them from any animal matter which would be likely to cause them to putrefy, it is customary to subject them to the fumes of burning sulphur, a process which requires considerable care in its application, for if threads are sulphured too long they become very brittle and are liable to crack and be weak. The threads prepared in this way are then further smoothed by

rubbing with a horse hair cloth, and are of various sizes, the smallest being not much heavier than horse hair. It is known as "minikin gut," the term minikin being applied to anything ridiculously small or diminutive. By other makers this size is called "bow gut," because it is employed in making the small whalebone bows used by watchmakers in their work. In surgical practice this "bow gut" is sometimes used for securing small vessels, and is termed No. 0; but the sizes above it, Nos. 1, 2, and 3, are the ones in most common use, and they are generally spoken of as *fine, medium, and large*. I am not in a position to say whether the catgut threads employed for all catgut ligatures are manufactured in Great Britain or come from abroad, but we know that Lyons in France, Italy, and Germany, too, are famous for the manufacture of catgut, and that for musical instruments the Italian gut is much preferred. It is known as the Roman string, and is remarkable for its strength and clearness. Dr. Ure suggested that this superiority of the Italian catgut is due to the fact that the Italian sheep are not so highly fed as our English ones, and, as is well known to physiologists, the membranes of lean animals are tougher than those of creatures in high condition and very fat. The catgut threads suitable for surgical ligatures are usually sold in hanks or skeins measuring about six yards each in length.

It is scarcely perhaps necessary to add that the material of which I have just been speaking has not the slightest connection with the white silk worm gut so much used by anglers, and proposed by some surgeons as suitable for sutures, and which is really the secretion procured from the silk vessels of the silk worm caterpillar (*Bombyx mori*), just before it begins to spin.

2. *Mode of Preparation.*—Having obtained skeins or hanks of unprepared gut of the different sizes required, the next step is to *carbolise* them. This is a matter requiring considerable care and management. The most convenient way of proceeding is to wind each skein or hank into a coil on one's fingers, and then string these coils on a thread of horse-hair, which has a bit of stick fastened at each end of it to prevent them slipping off. Such an arrangement facilitates the handling and removal of the hanks at any time. This done, place the hanks, now loosely coiled up, in an ordinary brown jar, or in one of the glass jars used for mounting specimens, or in a glass flask, and pour on them an emulsion made by mixing one part of crystallised carbolic acid (deliquesced by means of one-tenth its weight of water) with five parts of olive oil. In other words, the formula advised by Mr. Lister requires, for every

ounce of carbolic acid, 48 minims of water and five ounces of olive oil. Should a considerable quantity of the mixture be needed, the best plan to follow for making it is to mingle together in a suitable vessel the proper quantities of water and crystallised carbolic acid rendered liquid by heat, and then to add, by degrees, the required amount of pure olive oil, as described in my first paper. When these are well mixed together, the result is a very fine emulsion, in which menstruum the catgut should steep for *at least two months*, after which period it is ready for use, though it is better to let five or six months elapse before using it, and the longer it has been prepared the better. There is, however, one point of considerable importance to be attended to in the preparation of the catgut, and that is to place in the jar a partition of glass or other material, supported by pebbles or marbles, at a short distance above the bottom, *to afford space for the water that slowly subsides to accumulate in*, and thus prevent it from coming in contact with the hanks of gut. It will be at once seen how necessary this is, for if the gut lay soaking for two months in the water which had subsided to the bottom of the vessel instead of in the emulsion, it would not be properly prepared. This is due to the fact that, though the water would doubtless contain some carbolic acid, it has been found that if a watery solution of carbolic acid be used for making the catgut antiseptic, "the protracted immersion requisite to ensure completeness of the effect makes the finer kinds too weak and the stouter too clumsy." (*Lancet*, April 3, 1869). In addition to the above, another point to attend to is to see that the jar or vessel holding the skeins is kept in a cool place, and that it has a covering on it to prevent any volatilisation of the carbolic acid. It is also advisable to move the skeins or hanks about in the mixture at intervals. As I stated above, though two months is the time in which the gut can be considered fit for use, yet it goes on improving in quality for an indefinite period, if retained in the same oil, and gut that is carbolised and ready for use should always be kept in 1 to 5 oil.

From the description given above it will be seen that the mode of preparing the carbolised catgut is a simple one, and such as any surgeon could himself carry out with little difficulty, so that I am inclined to think that it would almost be as well if each surgeon prepared his own ligatures, for then he would know exactly what he was using, whereas, when he purchases them he is quite at the mercy of the instrument maker who sells them, and who may, from mere

ignorance or inattention, furnish him with ones that are made from *unsatisfactory gut*, or are *unreliable from not having been steeped the statutory time in the emulsion*. It will be as well to give in full Mr. Lister's warning as to the necessity for having the catgut ligatures properly prepared:—"It is of the utmost importance that the catgut should be rightly prepared, for, if merely imbued with an antiseptic salt, it is utterly unfit for surgical purposes, becoming soft and slippery when moistened, so that it will neither bear the requisite strain nor keep its hold when tied. But it is a happy circumstance that the animal tissue (the peritoneum with some unstriped muscular fibre from the sheep's intestine) undergoes a remarkable physical change if suspended for some weeks in an emulsion of water and oil, in which, after growing soft and opaque during the first few days, it gradually experiences an alteration of an opposite character, and at length becomes again quite transparent, and is then little affected by water, and holds better when tied than waxed silk." (*Holme's System of Surgery*. Vol. V, p. 622). Besides the quotation given above, I consider it desirable briefly to mention the following points elicited by Mr. Lister in the course of his investigations with catgut, and detailed by him in his *Observations on Ligature of Arteries on the Antiseptic System*, published in the *Lancet* of April 3, 1869. (1.) The objections to catgut in its dry state are its rigidity and a tendency on the part of the first knot to slip before the second half of the knot is secured. (2.) Though water renders catgut supple, and as little liable to slip as waxed silk, it is not a suitable menstruum for preparing it, for the reasons mentioned above. (3.) The best proportions for the carbolisising emulsion are those already given, any larger proportion of the acid impairing the tenacity of the thread. (4.) It is necessary to have the small percentage of water added to the mixture, for catgut soaked in a mere oily solution remains rigid, and the oil does not enter at all into its substance, "whereas, the small quantity of water which the acid enables the oil to dissolve renders the gut supple without making it materially weaker or thicker." (5.) The presence of the water brings about a change in the gut, indicated by a deep, brown colour. (6.) Gut of this colour "may be placed in a watery solution for a long time without swelling, as a portion prepared in a simple oily solution does." In regard to this point Mr. Lister remarks:—"This is a great convenience; for an oily solution is unpleasant to work with during an operation, and exposure to the air soon renders gut suppled

with water rigid from drying. But when it has been treated in the way above recommended, it may be transferred to a watery solution at the commencement of an operation, and so kept supple without having its strength or thickness altered."

As to the different sizes of carbolised gut used in surgical practice, they may be said to be four in number, ranging from No. 0, which is the "minikin gut," up to No. 3, which is very strong, and would be used for such a purpose as the ligature of the pedicle in ovariotomy. The two sizes chiefly employed by surgeons are the Nos. 1 and 2, known as fine and medium sizes; but the thickness of the gut used in any individual case will depend on the nature of the case itself, and on the surgeon's views as to the ultimate fate of such a ligature, a point on which I will have something to say before the close of this paper. The following is Mr. Lister's utterance on the matter:—"For tying an arterial trunk in its continuity, catgut as thick, when dry, as ordinary purse silk will be found best. But for ordinary wounds, where, if one ligature happens to break, another can be easily applied, much finer kinds may be employed, and are convenient from their smaller bulk." *Lancet*, 3rd April, 1869.

For the information of those who may care to prepare their own ligatures, I may say that the unprepared gut may be obtained from Mr. Gardner, 45 South Bridge, Edinburgh. It may be had at a comparatively cheap rate, for I understand that he can furnish it to hospitals at 48s. a gross, which equals 144 hanks or skeins, each hank containing one thread of about six yards in length. This represents a cost of about 4d. a hank, but to the profession it might be charged slightly more. The *carbolised catgut*, however, can also be purchased, all ready prepared, from Mr. Gardner, the price varying with the size of the gut, and whether or not each hank is wound on a small reel or bobbin. The three smallest sizes, with bottle and oil, cost 6d. a hank each, and the large size, 9d.; but if they are wound on bobbins this increases the price to 9d. and 1s. respectively. In the case of hospitals some reduction is made even from these charges. It will thus be seen that catgut ligatures are not expensive items in Lister's antiseptic system, and that the essential point in connection with them is to be sure that they have been properly prepared.

Since, then, the catgut ligature is so important a part of Lister's system, it must of necessity have a place in the armamentarium of any surgeon adopting the system in his practice,

and with the view of rendering it portable, and yet at the same time having it surrounded with the carbolic mixture which can alone insure its efficacy, various contrivances have been suggested from time to time for carrying it about. One of the most convenient is that seen in fig. 1, which represents Lister's catgut holder for placing in an ordinary pocket case. It was suggested by Mr. Lister himself, and was at first made of glass, but afterwards of silver, and was adapted to one end of the caustic holder in the manner described in the *Lancet* for 3rd April, 1869. "For every day use," says Mr. Lister, "a small oil-tight capsule may be carried in the pocket case, and this can be replenished from a larger stock as may be necessary. I have had a small silver bottle, with well fitting screwed top, adapted to my caustic case, and this contains two little rods of wood, with gut of two sizes wound upon them, with a few drops of the antiseptic oil; and now that torsion has almost entirely superseded the ligature in ordinary wounds, this small supply will probably last me for months." More recently this catgut holder has been made in a separate form,

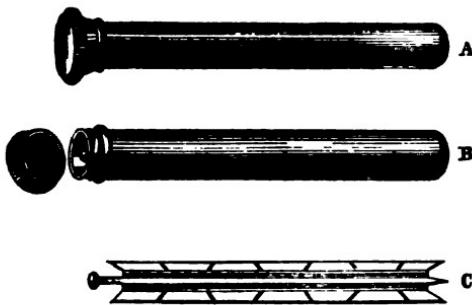


FIG. 1.

as represented in the above woodcut, where A is the holder closed, B shows the well fitting screwed top, and C is the winder. The case is made of metal, plated both inside and out, and the winder is of the same material, plated on each side. It will hold a hank of fine and one of medium sized gut, so that it contains about twelve yards of ligature material, a supply quite adequate for any large operation. It can be obtained from Mr. Gardner, 45 South Bridge, Edinburgh, at a cost of 6s. 6d.

For every day use in hospital, however, such an arrangement for the catgut is unsuitable; and as it was found that it was very inconvenient and disagreeable work unrolling the

gut off the bobbins in the bottles holding the oil, the catgut holder pictured in fig. 2 has been introduced for hospital use, and has been found very handy and cleanly. It was suggested by Dr. F. L. Grassett, formerly a house surgeon with Mr. Lister, and now practising in Toronto.

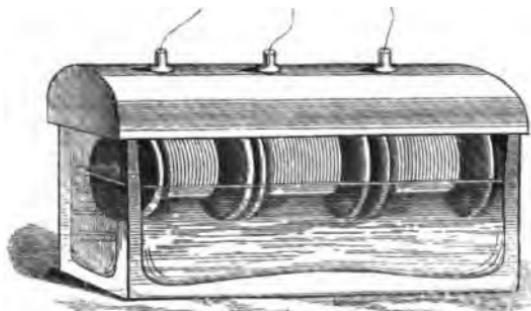


FIG. 2.

It consists of a trough made of strong glass, and having a metal lid, which is perforated with three holes through which the catgut can be drawn. Three reels holding different sized threads of carbolised catgut are placed on a metal rod in the centre of the glass receiver, and are partially immersed in the carbolic oil contained in it, so that in the act of drawing any of the catgut from the reel it passes through the solution. A trial of this catgut holder, especially during an operation, will soon demonstrate its utility and economy. It also can be obtained from Mr. Gardner, Edinburgh, at a cost of 10s.

3. *Method of Application.*—Leaving on one side at present the method of applying a catgut ligature to an artery in its continuity, I will confine my remarks to the closure of cut or wounded arteries in open wounds. The steps of the procedure are really just the same as when any other kind of ligature is used. The first thing is to lay hold of the orifice of the bleeding artery and pull it out from the surrounding tissues, either with a pair of ordinary artery forceps or with a tenaculum, so that the loop formed by the ligature may embrace the vessel and it alone. Then take a catgut ligature, measuring about two feet in length, encircle the artery forceps with it, and tie it loosely in a knot. Next, carry this knot over the point of the forceps by the tips of the two fore-fingers so as to embrace the mouth of the artery, and when it is quite down on the artery, tighten the knot so that all pressure is made at the bottom of the wound. In this way

the risk of including the artery forceps in the knot will be very much lessened. There should be no jerking or strong pulling when the knot is being tightened, for a very moderate amount of compression suffices, whereas violent tugging at the catgut may break it, or may displace it from the vessel, or may even cut through its tissues, which in some subjects are very friable. A second knot should then be tied, and in such a way as to make the two knots form what is termed a "reef-knot." Some surgeons deem it advisable to add a third knot, lest there should be any chance of the second one slipping, and there is no objection to such a course, though I consider it unnecessary. Be that as it may, however, as soon as the knot is properly secured, *both ends of the ligature are cut off short close to the knot*, thus completely abandoning the former line of practice, where it was customary to cut off only one end of the ligature and leave the other hanging out of the wound, that of the main artery being distinguished by a knot tied on it. The reason for this course was that when the sloughing of the arterial coat had taken place the various ligatures could readily be withdrawn. Should the case be one where it is necessary to use a tenaculum, owing to the end of the vessel being difficult to isolate from the other tissues, the steps of the operation are the same as when the artery forceps are employed, but care must be taken to make the knots beneath the instrument, and not over it, so as to allow of its being withdrawn when the tying is complete. These remarks which I have just made are equally applicable to the cases where it is necessary to ligature an artery in its continuity. The operative measures are exactly the same with the carbolised catgut as with a silk ligature, and the same manual dexterity and care are demanded with the one as with the other.

While, however, the mode of applying the ligature is the same in both cases, I wish it to be understood that in the one class there is superadded all the antiseptic precautions which Lister's system necessitates, and which are at variance with much that was done under the old régime, especially during lengthy operations. I will perhaps make myself clearer by giving an illustration of what I mean. In the course of hospital operations conducted without any antiseptic precautions, it is not unusual to see the house-surgeon, to whom is usually deputed the office of tying the arteries cut during the operation, standing opposite to his chief with a number of ligatures passed through the button-hole of his coat to facilitate his work and prevent delay.

Indeed, in the last edition of Heath's *Minor Surgery*, in the chapter on the Management of the Operating Theatre, I find him saying, "the best position for the house-surgeon is, as a rule, *opposite* the operating surgeon, and he should have loosely noosed in his button-hole a sufficient number of ligatures, not less than sixteen inches in length." Now such a procedure would be quite at variance with the spirit and details of Lister's system, where each ligature should be cut as required and passed directly to the surgeon through the cloud of spray. If the ligatures happen to be cut before being wanted, they should be placed in some carbolic lotion along with the instruments, and not allowed to lie about on the table or elsewhere. Further, I think that the practice I have seen some surgeons follow of holding a catgut ligature temporarily between their lips, when both their hands have been occupied, is decidedly objectionable, and one that should not be followed. I have thought it advisable to allude to points such as these, so that I may not be misunderstood when I say that the catgut ligature is applied much as any other ligature.

I now proceed to say something on that most important of all points, the fate of the carbolised catgut after it has been placed among the tissues of the living body. A very great diversity of opinion has existed, and I fancy still does, in the minds of many surgeons upon this question; but it appears to me that this is due to sufficient stress not having been laid upon the condition of the wound in the different cases that have been cited and referred to as authorities to settle the matter under dispute, and I think that this is the real explanation of the great discrepancies that have been found to exist in the condition of the catgut when opportunities have occurred for examining it after death. Accordingly, I shall first give the conditions observed in the catgut in *aseptic* cases or those in which putrefaction did not occur, and then those in *septic* cases where putridity was present, and in this way I hope to make the matter clearer and draw from the facts elicited some important practical rules for surgeons.

4. *Influences of the Tissues on Carbolised Catgut in Aseptic Cases.*—Under this head, the first investigations to which I would refer are those of Mr. Lister himself. Although the use of "animal ligatures" is a subject that has at various times engaged the attention of surgeons, as can be seen by perusing the article on Aneurism in Cooper's *Surgical Dictionary*, the results obtained were so much against them that they had been entirely discarded. The advantage and feasibility, how-

ever, of reintroducing them under different conditions presented itself to Mr. Lister, from the experience which his antiseptic system had afforded “of the disappearance without suppuration of large dead pieces of skin and other textures.” (*Lancet*, April 3, 1869.) With these facts before him, he ligatured *antiseptically* in two places the right carotid artery of a healthy calf, a few days old. There was an interval of about an inch and a-half between the two ligatures, and the sheath of the vessel was left undisturbed in the intervening part. In one place strips of peritoneum were used, and in the other fine catgut. The wound healed without any pus, and a month after the operation, the animal, which was in perfect health, was killed, when the ligatures were found to have been transformed into bands of living tissue. “The two pieces of catgut which had been tied round the vessel had become, as it were, fused together into a single fleshy band, inseparably blended with the external coat of the artery.” (*Lancet*, April 3, 1869.) The ligature composed of the strips of peritoneum was in like manner continuous with the arterial walls. A microscopic examination of the parts only confirmed the existence of the organisation which was so apparent to the naked eye, for not only was the ligature incorporated with the tissues of the outer arterial wall, but its substance was invaded and replaced by fibro-plastic material, consisting mainly of long multi-nucleated cells, not unlike fibres in their appearance. From what he saw of the behaviour of the catgut in this case, Mr. Lister was led to believe that it was removed by absorption, and its place taken by new living tissue, which not only grew at the expense of the dead, but was also formed, as it were, on its mould and pattern. In this way catgut ligatures surrounding arteries might be said to be “transformed into bands of living tissue,” which retain the shape of the dead but nutritious masses composing the ligatures. I will say nothing here as to the additional evidence of the absorptive power of the tissues over carbolised catgut afforded by its employment as sutures, but will quote next some observations made by Dr. W. J. Fleming, of Glasgow, which independently go to confirm those of Mr. Lister. They are to be found in the *Lancet* for May 27, 1876. Dr. Fleming was anxious to ascertain whether carbolised catgut, when placed among living tissues, “is absorbed, that is, dissolved, taken up, and carried away without leaving any trace behind, in the same way as a soluble crystalline substance introduced into the tissues; or whether it is organised, converted into tissue, and becomes a living active part of the body.” His plan was to place carbolised

catgut, with antiseptic precautions, amongst the tissues of living dogs and rabbits, and at the end of some four weeks to kill the animals with bleeding, and inject the vessels with Prussian blue. I give the results in his own words:—"These experiments show that a gradual softening takes place from without inwards, the catgut breaking down and becoming infiltrated with cells, probably leucocytes. This part of the process takes from five days to about twenty, varying with the specimen of catgut, the tissue amongst which it is situated, and the age and vitality of the animal. Next the pultaceous mass into which it has been converted begins to metamorphose, and is soon permeated with blood-channels, and ultimately may be described as a cast of the catgut, a kind of granulation tissue freely supplied with blood-vessels, which in many of my sections are very fully injected." It is clear from this that Dr. Fleming's experiments verify entirely the views at first put forth by Mr. Lister as to the fate of carbolised catgut among the living tissues, "that the dead, but nutritious mass, serves as a mould for the formation of new tissue, the growing elements of which replace the materials absorbed, so as to constitute a living solid of the same form." (*Lancet*, April 3, 1869.) It may be somewhat difficult to realise the fact thus insisted on, that the ligature itself is removed and is yet replaced by new material, which moulds itself to the shape of the substance taken away, but I think it will be rendered clearer and plainer by a very happy simile given by Dr. Hector C. Cameron, in an able paper published by him in the *Lancet* for March 9, 1878, on the Antiseptic Ligature of Arteries, where, when speaking upon this point he says:—"If a pair of woollen stockings be constantly worn into holes at different parts, and these holes be always darned with silk, the pair of woollen stockings may ultimately be converted into a silk pair of much the same size and shape as the original. So the dead catgut may be replaced by living tissue, but with this important difference, that it serves as pabulum for the surrounding living parts, which remove it by a sure process of absorption."

5. *Influence of the Tissues on Carbolised Catgut in Septic Cases.*—The point of difference between the class of cases we have just considered and the present ones, is that in the former the healing changes in the wounds progress without the presence of putrefaction, and consequently with freedom from inflammation and suppuration, whereas in the latter putridity occurs, and the tissues of the parts are bathed in putrescent discharges, which are chemically acrid and irritating in their

nature. Under these circumstances it is not difficult to understand that the fate of a foreign body will be very different in the two sets of cases, and that is what we find to be the case. Those who have made trial of the carbolised catgut ligature, without being successful in keeping their wounds antiseptic, have been disappointed with it, finding that instead of being organised, as they hoped, it softened, disintegrated, and disappeared. This is not to be wondered at, especially when we remember that Dr. Fleming's investigations show that the earliest stage in the changes undergone by carbolised catgut in the tissues under *aseptic conditions* is one of softening, no doubt to allow of the penetration of its substance by the elements of the surrounding tissues preparatory to organisation and consolidation. Now, when catgut is in this softened state, if it is brought under the influence of putrid discharges, it will undoubtedly break down, and, as Mr. Lister says, "come away, like the other minute sloughs of cellular tissue which appear along with the pus." (Holme's *System of Surgery*, vol. v, p. 622.) Instances of the behaviour of the catgut ligature in non-antiseptic wounds may be found scattered through the different medical journals, and the same tale is frequently told that the catgut has proved itself unreliable, and has softened and disappeared. There is no better description of the state of matters that exists under the conditions to which I allude than that given by Mr. Spence in the *Lancet* for June 5, 1869, where he reports the *post-mortem* examination made in a case of ligation of the right common carotid with a catgut ligature, which was fatal on the third day. The following is his account:—"On examining the carotid artery I was not a little surprised to find that it did not seem in the slightest degree constricted at the point of deligation; in fact, at first I saw nothing which I could recognise as the ligature. On careful examination, however, I found that what at first seemed some lymph or tissue, was the catgut softened. The circle of the ligature had given way apparently on the side of the vessel nearest the trachea, the entire knot being connected with the end of the ligature, which was visible. On looking at the ligature with a pocket lens, the texture of the gut was distinctly seen, but it was so gelatinous and pulpy that it seemed as if it were cast in gelatine, and a portion removed for microscopic examination when placed between two slips of glass, spread out like a fluid." Hence, Mr. Spence concludes, "that catgut, however prepared, is liable to become altered, softened, and disintegrated by the heat and moisture of the living tissues around it," and I am inclined to think that his

surmises are correct when they apply to wounds not managed according to Lister's system, and where the catgut has been very hurriedly, and consequently imperfectly, prepared (as was the case with that used by Mr. Spence), for the longer it has been in the carbolic emulsion the better able will it be to resist the influence of septic fluids. Of course we may have instances in which even in wounds treated without antiseptic precautions the catgut will behave as it does in aseptic wounds; but they are really so in their nature, at least in their deeper parts which have chanced to unite by first intention. Indeed, there seems to me nothing wonderful in the catgut undergoing different changes when placed under different surroundings, and the aim of surgeons should be never to let it have the chance of coming under conditions that are known to be unfavourable to it, and render it unreliable as a haemostatic. Even Mr. Lister admits that though in septic wounds there is probably no more risk with it than with other ligatures, yet that it is not absolutely safe, but I am sure that he would not advise its employment for ligaturing an artery in its continuity, unless under all the antiseptic precautions of his system.

6. *Points of Surgical importance connected with Carbo-lised Catgut.*—Under this head I will mention, briefly, some surgical facts that the use of the carbolised catgut in aseptic wounds has brought out, and which are entitled to careful consideration. (1.) In the antiseptic ligature of arteries in their continuity, the wounds heal at once without inflammation and suppuration, because there is no ligature to come away. In other words, there is no destructive process goes on in the shape of ulceration by which the ligature is to be cast loose with, perhaps, in some cases, a small slough of the constricted outer coat of the artery. Mr. Lister thus states this fact when speaking of the antiseptic ligature of arteries:—"One point which it has brought out in striking relief is, that a portion of dead tissue is not necessarily thrown off by suppuration, but, unless altered by putrefaction, or artificially imbued with stimulating salts, serves as pabulum for the surrounding parts, which remove it by a sure process of absorption. Hence the death of a portion of the external coat included in the ligature does not of itself render it a cause of suppuration." (*Lancet*, 3rd April, 1869.) (2.) It does not seem necessary, as in the old days of the silk ligature, that the inner coats of the artery must be cut through, so as to set up a reparative process in the shape of "adhesion" of the divided surfaces. As Mr. Bickersteth says:—"In Mr. Lister's case of the calf there was no division of the artery, the middle and internal coats were

simply blended together, so as to obliterate the cavity of the artery without any solution of continuity." (*Lancet*, 12th June, 1869.) (3.) The antiseptic catgut ligature applied round an artery, instead of weakening it, really strengthens it, for it forms a sort of ferrule round it. To quote Mr. Lister's words: "It appears, then, that by applying a ligature of animal tissue antiseptically upon an artery, whether tightly or gently, we virtually surround it with a ring of living tissue, and strengthen the vessel where we obstruct it." (*Lancet*, 3rd April, 1869.) (4.) If carbolised catgut is used for ligatures, to obtain its full advantages *it is imperative to carry out all the details of Lister's system.* To employ the catgut without these is only to court failure and disaster. For it is only under the conditions gained by antiseptic management that the absorptive and organising changes go on which give to catgut such great value; whereas, where the fluids in a wound are putrescent, these changes seem to be overcome by the altered conditions present, and the ligature not only breaks down but becomes imbued with the septic discharges, and acts as an irritant leading to inflammation, suppuration, and perhaps sloughing. Mr. Lister's teaching on this point is plain:—"The surgeon, therefore, may now tie an arterial trunk in its continuity close to a large branch, secure alike against secondary haemorrhage and deep seated suppuration—provided always that he has so studied the principles of the antiseptic system, and so carefully considered the details of the mode of dressing best adapted to the particular case in hand that he can feel certain of avoiding putrefaction in the wound." (*Lancet*, 3rd April, 1869.) Again he writes:—"An eminent London surgeon wrote to me some time ago, asking for catgut, as he wished to use it for tying the external iliac. I wrote back to him saying, that if he did not feel sure he could avoid putrefaction in the wound, I would not advise him to use catgut." (*British Medical Journal*, 26th August, 1871.) (5.) Though the use of carbolised catgut in septic wounds is not advised, yet it would seem to be quite as efficacious as other ligatures, and this view is supported by some experiments which Mr. Lister carried out to test the value of the catgut under septic conditions. He says:—"Should putrefaction occur, I was at first uneasy lest the prepared catgut might soften and permit haemorrhage. I was, therefore, at the pains to test some of the prepared catgut in the following manner. I tied some pieces of it at intervals round a cylinder of india-rubber, so as to pinch the india-rubber to a considerable degree of constriction, and then introduced it into putrid serum of blood, and kept it for a week at a temperature of about 90°, at

the end of this period, the india-rubber was still constricted, showing that the catgut had retained its hold in the putrid liquid in spite of the constant strain of the elastic material upon the knots." (*British Medical Journal*, 26th Aug., 1871). (6.) Mr. Lister thus briefly sums up the merits of the catgut ligature when used *under antiseptic precautions*:—"The catgut, as tied in the ordinary reef-knot, with the ends cut short, seems to me to be a perfect haemostatic. It has all the simplicity and universal applicability of the ligature, with, at the same time, the virtual absence of any foreign body from the wound." (*British Medical Journal*, 26th Aug., 1871).

7. *Carbolised Catgut useful in other ways besides as a ligature.*—The length to which my paper has extended prevents me from doing more than cursorily alluding to the fact that carbolised catgut may be employed in antiseptic surgery in various ways in addition to its use as a ligature. In another communication I hope to show how useful it is as a drain for wounds, and, under certain conditions, as a suture, allowing us to deal with cases that previously were beyond the range of successful operative interference. Mr. Lister has himself given instances of this in the satisfactory treatment of two cases of irreducible hernia. Since then, the experience of others has gone fully to confirm Mr. Lister's statement, "that the catgut stitch becomes a new engine in surgery, enabling us to attach deeply seated parts to each other, leaving the connecting medium to be removed by absorption." (*British Medical Journal*, August 26, 1871). It is also clear to any one impartially studying the whole of the facts that have been revealed by Mr. Lister's labours, that the introduction of the carbolised catgut *under antiseptic precautions* has not only widened the field of surgery, but has greatly tended to enlarge our ideas of life, especially as carried on with its ever changing restlessness in the hidden tissues of our frame. And it seems to me that surgeons of the present day have obtained what their predecessors frequently strove after, and found beyond their reach, but the desire for which took expression in their writings, as when we find Sir Astley Cooper saying:—"It would be an extremely desirable thing if any person invented a ligature composed of materials which would admit of solution; he would, by such an invention, greatly serve his profession." (*Practice of Surgery*. Eighth edition. P. 161). The hope expressed in these words has been more than realised. Mr. Lister, by his carbolised catgut, has not only greatly served his profession; but by it he has also immensely benefited mankind.

To recapitulate, then, in conclusion, I would direct attention to the following points:—

- (1.) The catgut ligature employed in Lister's antiseptic system is made from the small intestines of sheep and lambs.
- (2.) To *carbolise* it, it requires to be steeped for some time in a mixture of carbolic acid, water, and olive oil.
- (3.) That it should remain in this for at least *two months* before it is fit for use, but it is better for being kept in it a longer period.
- (4.) That when used as a ligature the ends are cut off close to the knot.
- (5.) That it is absolutely necessary to carry out all the details of Lister's system when a carbolised catgut ligature is employed.
- (6.) That if these details are observed, putrefaction will be prevented in the wound, and the carbolised catgut will undergo changes of an absorptive and organising character.
- (7.) That an artery tied in its continuity *antiseptically* with such a carbolised ligature is really strengthened at the point of deligation.
- (8.) That to employ it as a ligature, without following Lister's system, is to court failure with it and run considerable risk.
- (9.) That, under certain circumstances, carbolised catgut is useful for draining wounds and for sutures.
- (10.) That the introduction of the carbolised catgut has considerably enlarged the field of operative surgery.

(To be Continued.)

COMPLICATED TRAUMATIC TETANUS.

By E. D. MACKELLAR, M.B., POONA.

THE following case is perhaps interesting from the peculiar positions in which Guinea worms were found, from the difficulty in accurately accounting for the attack of tetanus, and from the fact that a severe injury of the spleen did not more rapidly prove fatal.

During the late famine in the Maratha country, a Hindu boy of about fifteen years of age was admitted into one of the Famine Relief Camps, with the following history:—He had been deserted by his parents, and had supported himself by

begging; but about ten days before coming to the relief camp he was gored in the side by a bullock, and had become so weak that he was no longer able to walk from place to place asking for alms.

On admission he was very emaciated. His tongue was coated, his skin hot and dry, and his pulse quick. On his left side, immediately below the true ribs, was a granulating surface about two inches long and one broad, evidently the result of a superficial lacerated wound. From the superior border of this surface there escaped from time to time particles of undigested grain and other gastro-intestinal contents. These substances had a faintly faecal odour. On the third day after admission, slight trismus and opisthotonus supervened. He died two days afterwards. The autopsy was made about twelve hours after death. The thorax presented nothing unusual beyond what is generally seen in famine-stricken people, with the exception of slight diaphragmatic pleurisy. The abdomen contained a considerable amount of sero-purulent fluid, in which floated numerous friable fibrinous masses. There was adhesion between some of the coils of intestine. There was a good deal of perihepatitis and fibrinous deposit on the under surface of the diaphragm. There was much inflammatory matting and thickening in the neighbourhood of the spleen and corresponding flexure of the colon. Where the transverse colon passes into the descending, the bowel was firmly adherent to the abdominal wall. The situation of this inflammatory adhesion corresponded with the external injury. The point of the little finger could be passed beneath the free border of the skin that bounded the upper portion of the external granulating surface, into the interior of the intestine. The free margin of integument bounding the granulating surface had thus formed a sort of valve over the punctured wound leading into the intestine. The lips of the puncture in the intestine were so closely adherent to the abdominal parietes, and so accurately corresponded with the external wound, that faecal matter did not find its way into the peritoneal cavity. The mucous membrane of the intestine was not inflamed above and below the wound.

The spleen was enlarged and soft, and covered with a friable fibrinous coating. It was firmly adherent to the neighbouring portions of intestine and to the abdominal wall. The part corresponding with the punctured splenic flexure of the colon presented a cup shaped cavity large enough to contain a grape. Its walls were rough and coated with soft fibre.

Severe injuries from bullocks' horns are common in India,

and, as in this case, are generally of the nature of partly lacerated and partly punctured wounds. In this instance the boy had probably been struck from behind, and the horn, crushing through the anterior border of the spleen, had made its way into the intestine. Possibly the greater portion of the blood from the injured spleen escaped by the external wound, and if any had made its way into the cavity of the peritoneum, it had been absorbed before examination.

Though it is rather unusual to find Guinea worms situated deeply in the body, one of fair size was discovered coiled up in the sub-serous tissue of the bladder.

Under the idea that the tetanus might be traced to inflammation of an intercostal nerve, or to changes in the spinal marrow, the vertebral canal was opened. None of the expected conditions were found, but a Guinea worm was discovered lying on that portion of the theca of the cord that corresponds with the central and superior dorsal vertebrae. One end of the worm was immediately below the skin of the back. From this point the worm passed directly through the erector spinae muscles, gaining the vertebral canal by one of the intervertebral foramina. It is an interesting question what share the Guinea worm had in causing the attack of tetanus.

THREE CASES OF CEREBRAL ABSCESS CONSEQUENT UPON SUPPURATIVE DISEASE OF THE MIDDLE EAR, WITH REMARKS.

By THOMAS BARR, M.D.,

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(Read before the Medico-Chirurgical Society of Glasgow, 2nd April, 1880.)

GENTLEMEN.—In inviting your attention, this evening, to the fatal consequences which are sometimes developed out of suppurative diseases of the ear, I venture to say that the importance of the subject is in inverse proportion to the attention which medical men have hitherto devoted to it. Discharge from the ear is, I fear, in too many cases, viewed with indifference by the profession, as well as by the public. Why is it thought so lightly of by some members of the profession? I believe it is very much from a want of due appreciation of

the real source of the discharge. Otorrhœa is not a disease, but the result of disease. It is, in the great majority of cases, really an expression of a diseased process in the deep parts of the ear within the tympanic membrane.

The purulent matter from the simple "running ear" which has lasted for any length of time, is, with few exceptions, secreted by the mucous lining of the middle ear, in whole or in part, and escapes thence through a perforation in the tympanic membrane, which may vary in size from a pin point to almost total destruction. By the middle ear anatomists understand the tympanum, Eustachian tube, and mastoid cells. If we exclude the cartilaginous part of the Eustachian tube, the middle ear consists of cavities hollowed out in the temporal bone, filled with air and lined by a mucous membrane in the most intimate nutritive relation with the periosteum beneath. It is very important to keep in mind this remarkable anatomical feature of the temporal bone—viz., the numerous hollow spaces (one of which—the antrum mastoideum—is almost as large as the tympanic cavity itself) which are found chiefly in the mastoid and petrous portions, but are found also in other parts of the bone. These cavities all communicate freely with the tympanum, and are apt to participate in suppurative processes which may originate there. The cells situated in the mastoid bone are separated from the dura mater only by a thin cortex of bone, just in the situation of the lateral sinus, while the tympanum itself at its roof has but a very thin plate of bone, which is often in fact defective, separating its mucous membrane from the dura mater.

In addition to the dangers which may at any time arise from the proximity of these osseous spaces to the vital parts within the cranium, the anatomical arrangement just referred to presents very favourable conditions for the retention, accumulation, and decomposition of the purulent secretion. The decomposing pus, loaded with bacteria, stored up in these cellular spaces may often remain, sometimes dried up into cheesy looking masses, many years without disturbance; but it may also lead suddenly to rapid ulcerative conditions in the neighbourhood, or, by absorption, to fatal embolic and septic diseases. Besides, the gases of decomposition which arise from these putrefying masses do not merely pass outwards, where they fall very unpleasantly upon our sense of smell, but they may pass upwards upon the brain itself, and exert an irritating and putrefactive influence there. When we consider that the roof of the tympanum and mastoid cells is often very thin, sometimes at parts only membranous, and always perfor-

ated by foramina, it is easy to understand that these emanating gases may gain admission to the cranial cavity.

We thus see that the source, in most cases, of discharges from the ear, is an inflamed mucous membrane, which is so intimately connected with the periosteum as to threaten to invest the disease with all the gravity of a periostitis. All surgeons recognise periostitis, with the attendant danger of caries and necrosis, as a serious affection in any bone of the body; but in a cranial bone, and especially in the temporal bone, it has a much more weighty significance. In short, Gentlemen, I do not know any part of the body where, from a theoretical standpoint, we should so earnestly strive to avert inflammatory processes and accumulation of purulent secretion. The following three cases, which have come under my observation during the past two years, show that practical experience bears out this *a priori* statement. I should mention that one of these cases—the first one—has already been reported by me in detail, in the *Glasgow Medical Journal* of May, 1878, but for purposes of comparison I have summarised it in my paper to-night.

CASE I.—S. S., a strong, healthy boy, 14 years of age, suffered for ten years from a “running ear” on the left side, originating in measles. On Monday, 31st December, 1877, he was seized with severe pain in the ear and side of the head, after a slap with the open hand from his master. The pain was soon followed by severe and persistent vomiting, and by considerable feverishness. These symptoms continued, the pain in the side of the head being very intense, until the eleventh day of his illness, when he became comatose, and his arms and hands remained in a state of spasmotic contraction. Death followed two hours afterwards.

Post-mortem examination revealed a large abscess, having a very fetid odour, in the left temporal lobe of the brain, in the portion lying over the roof of the tympanum. The dura mater over the *tegmen tympani* was softened and thickened, but there was no opening in the bone communicating with the tympanum, and, indeed, no caries could be found in any part of the temporal bone. The tympanic membrane was found to be destroyed, while a soft polypous growth, and some granulation tissue occupied the greater part of the cavity of the tympanum. The malleus and incus lay loose in the upper part of the cavity, embedded in a brownish semi-fluid substance, which emitted a most fetid odour. The stapes could not be found.

CASE II.—J. L. M., a lad, 17 years of age, of a very lively

disposition, began to suffer from defective hearing in the left ear at the age of eleven years. This continued, sometimes better and sometimes worse, and for two years before his fatal illness, there was also an intermittent purulent discharge from the same ear. This discharge was occasionally attended with pain, though at no time of a severe character, and generally had a very offensive odour. He had usually a fresh complexion, and had been a healthy child; but two brothers had died of tubercular meningitis. Two months previous to his death he spent his holidays at Millport, when, as his father expressed it, he was never happy unless when boating, or fishing, or climbing the hills—in which he excelled his companions. Before the discharge from the ear began, certain lotions were poured into the ear for the relief of the deafness, while the discharge was treated with occasional syringing with warm water. No aural specialist was, however, consulted.

While at the coast in July, he was very fond of bathing in the sea; but he stopped it, remarking to his mother that he thought it injured his head. After he came home from the seaside, it was observed that he was losing his freshness, and he frequently complained of headache, binding his head with a handkerchief, which seemed to make it more comfortable. On Sunday, the 7th September, 1879, he complained a little of this pain in the head, and on the following day he went to business, although he felt very unwell. In the evening he attended a French class as usual; but immediately on coming home he went to bed, saying he could hold out no longer. During the Monday night and the Tuesday morning he vomited frequently, this being followed by a strange feeling of prostration. After the first twenty-four hours he did not vomit again until the Monday and Tuesday of the following week, when it was repeated on two occasions after partaking of egg. The pain was limited to the left side of the forehead, and it was easier when he lay on his back; he said that when he lay on his left side he felt as if some "stuff ran from one side to the other." The pain, however, only continued the first two or three days, and was not at any time intense.

There was a slight form of aphasia from an early period of the illness. He failed to remember the name of the street in which he lived, and when he wished to refer to Partick (a place visited by him daily when well) he could only point in the direction of Partick and say, "that place near to Glasgow;" he could not even remember his own name. This aphasic condition continued to the end of the illness. I was asked to see him four days after the beginning of his illness, in order to

treat the "running ear." I found, in addition to the symptoms mentioned, that the patient complained of a peculiar feeling in his head, sometimes a heaviness and sometimes a sensation as if he had two heads; and also, that he was very drowsy, although unable to get calm sleep. He was able to take some food. His bowels were constipated. There was no feverishness. In view of these symptoms and suspicions of a grave intra-cranial disease, I resolved in the meantime to refrain from any purely aural treatment, contenting myself with clearing the pus out of the auditory canal, and examining the deeper parts, when I found a large part of the tympanic membrane gone at the upper part.

These symptoms went on—namely, the aphasia, the drowsiness (he generally lay on his back with his eyes closed, but when roused spoke intelligently), and the peculiar feelings in his head—and on the following Thursday, ten days after the onset of the vomiting, he was able to walk, in the forenoon, with a staggering gait, from the dining room to the kitchen. On the afternoon of that day, while on the sofa in the act of eating a piece of chop, his father being seated beside him, he was seized with a general trembling, and became completely unconscious. This comatose condition lasted for about two hours. I saw him two hours after he recovered from this seizure and found his temperature to be 102°. After this there was paralysis of the right side, though not quite complete, and during that night he was in a state of somnolence, with heavy and laboured breathing. He spoke very little after this attack. The day following I asked Dr. Finlayson to see the patient with me in consultation when, just as our examination was completed, the patient had another seizure, this time with twitchings of the face and foaming at the mouth. After a time he partially recovered consciousness, was able to swallow and spoke a little. He remained in a state of stupor, capable, however, when roused, of giving an intelligent answer, till the next day, Saturday, the 20th September, when he became quite comatose in the afternoon, and continued in that condition till 11 P.M., when he died, 13 days after the beginning of the acute illness.

The autopsy was kindly made by Dr. Coats, who furnished me with the following notes:—

On opening the skull the brain exhaled a very remarkable putrid sour odour. In removing the brain the left temporo-sphenoidal lobe was found to be adherent to the base of the skull by its inferior surface. On this surface the brain had a dark blue colour, and the whole inferior part of the temporo-

sphenoidal lobe felt pulpy, while the convolutions were seen to be flattened or spread out so as to appear as if partially obliterated. On cutting into this lobe an abscess was found. Its contents were a dirty, greenish, decomposing pus, of a glairy consistence, and exhaling an exceedingly offensive, almost gangrenous, odour. The abscess was lined by a layer of soft consistence and of a dark bluish colour. The part specially occupied by the abscess was the external and inferior portions of the temporo-sphenoidal lobe, but it may be said that the greater part of the lobe was involved, except its extreme posterior portion. Over the temporal bone the dura mater was adherent and of a blue colour—at one place it had become pulpy.

The left temporal bone was removed from the skull by Dr. Coats, in order that I might examine it carefully at home.

On separating the dura mater, I found two pretty large carious openings communicating with the mastoid cells, the larger one was situated at the groove for the lateral sinus, the other was found in the roof of the mastoid cells behind the tympanum and over the antrum mastoideum, the largest of the cavities in the mastoid bone. Water injected by the external auditory canal passed out of these two openings. The dura mater forming the walls of the lateral sinus was much thickened, both at the carious opening and for a distance above and below it, as if a compensatory act of nature for guarding against haemorrhage. The dura mater covering the carious opening in the roof of the middle ear was also considerably thickened. I washed out a quantity of a very fetid dark substance, looking like a mixture of blood and pus, from the tympanum and mastoid cells with a syringe.

On cutting away the anterior wall of the external auditory canal, another carious opening was seen at the inner end of the canal in the upper and back wall—this also communicated with the mastoid cells. The upper half of the membrane was destroyed, the lower half had a small part of the handle of the malleus still adhering.

I did not completely open the tympanum, as I desired that the carious openings should remain undisturbed.

A fourth opening, also made by caries, was found passing irregularly through the squamous part of the temporal bone, its inner extremity being situated a little above and behind the groove for the lateral sinus. This somewhat remarkable perforation of the wall of the skull had not caused any appearance on the surface of the head during life, nor had that particular spot, so far as could be ascertained, at any time been complained of.

CASE III.—D. D. S., a boy 12 years of age, suffered from an attack of measles at the age of 6 years, since which there had been a discharge from the left ear. He was always considered a delicate boy, and was subject to bronchitis, though usually spirited and fond of play. His father suffers from hip-joint disease. The discharge from the ear was intermittent until some months before death, during which it was continuous. There was occasionally some pain, though not severe, when, as the mother remarked, "the ear was gathering." The discharge was always of an offensive smell, latterly extremely so, and frequently tinged with blood. The hearing was very defective on the left side.

On Sunday, the 28th December, 1879, when he returned from the Sunday school in the evening, he was seized with great pain in the region of the left ear and in the back of the head, but it was most severe behind the ear over the mastoid region. He complained of a shivering sensation, especially in the head, which was attributed at the time to the fact that his hair had been cut on the previous day. For months before he had occasionally remarked to his mother that he had a peculiar "creeping, shivery" sensation in the head.

There was severe vomiting for the first three or four days. It began on the Sunday night, continued the whole of Monday and Tuesday, on Wednesday not so frequently, and only once on Thursday. During that time the vomiting was not connected with the taking of food, of which he ate very little. His thirst was great. There was great heat of skin, and the face was flushed and pale by turns. The bowels were confined, and remained so during the whole course of the disease, being relieved by occasional teaspoonful doses of compound liquorice powder.

The pain of head and back of ear was agonising for the first two days, but afterwards became less, although, till the end of this illness, he seemed to have some pain. On Thursday, the 1st January, Dr. William Chalmers, who was in attendance, applied two leeches over the mastoid process. On the day following blistering fluid was painted over the same region, while two days after that a cantharides plaster was put over the temple. The leeches removed a good quantity of blood, and the blisters "rose" well. These remedies were understood to have relieved the pain. At the end of the first week severe rigors began, lasting at first about twenty minutes, while afterwards they continued as long as an hour. They were followed by heat and then by sweating. The shivering was said always to begin in the head.

On Monday, 5th January, I saw him for the first time. He lay on his back pale and drowsy, but easily roused, when he gave intelligent answers to questions, and seemed to observe with attention what was going on. I cleaned out the external auditory canal of a quantity of offensively smelling pus, and found the tympanic membrane almost completely destroyed, and the exposed mucous lining of the tympanum covered with exuberant granulations which easily bled. Externally, at the junction of the mastoid and squamous parts of the temporal bone, there was some oedema and tenderness on pressure, but there was some doubt whether it might not be connected with the blisters. The question of making a free incision at that part was considered, but it was decided to wait and watch closely. There was neither oedema nor swelling over the mastoid process itself. In a day or two the oedema and tenderness passed off, and there seemed no indication for cutting into the bone. Meanwhile, these rigors continued three or four times a day, and as often by night, and the parents assert that during these attacks he was unconscious, with stertorous breathing, and sometimes the eyes were half open with eyeballs turned up. In these attacks the bowels and bladder often acted involuntarily in bed. The most severe attack took place on Saturday, the 17th January, when he lay the whole forenoon in an unconscious state. There were general tremors and stertorous breathing, the nose and brow were cold, and the face pale. He recovered from this in the afternoon, and conversed intelligently with his mother. On Sunday, the 18th January, exactly three weeks from the onset of this illness, he sunk into a completely unconscious state, with eyes open and fixed and pupils dilated, and died at noon.

Permission was given to examine the head, and Dr. Foulis very kindly accompanied me on Monday evening and made the *post-mortem*. On opening the skull no meningitis or cerebritis was detected, but on removing the brain a very fetid odour arose, which was found to be due to a circumscribed collection of fetid pus under the dura mater in contact with the inner surface of the mastoid process and posterior surface of the petrous bone on the left side, just at the groove for the lateral sinus. The walls of the lateral sinus were thickened, and along with the neighbouring dura mater, were separated from the bone by the collection of pus. There was no pus in the lateral sinus. The brain itself was healthy, with the exception of a slight discolouration of the surface immediately over the abscess.

The left tympanic membrane was gone and the lining of the tympanum soft, tumid, and greyish-red, and none of the ossicles were found with the exception of a part of the malleus, which was eroded. The mastoid cells were full of whitish-cheesy looking fetid matter, evidently dried pus, and the cavities in the bone were larger than those on the opposite side, but no evidence of caries could be found in any part of the temporal bone. On the right side the tympanum contained a quantity of viscid mucus. The lining membrane was reddened and slightly tumid.

The third case was properly one of suppurative inflammation of the dura mater; but I have included it here, as it was really an abscess pressing on the substance of the brain, and therefore likely to cause phenomena similar to a collection of matter in the interior of the brain, the difference being merely one of position.

An interesting question arises here—What is the proportion of cases of cerebral abscess dependent upon suppuration in the ear? Sir William Gull and Dr. Sutton, in their article on abscess of the brain in Reynold's *System of Medicine*, assert that disease of the middle ear is the commonest cause of that condition. Of 76 cases given in that article, 27, or rather more than one third, were consequent on ear disease. Professor Lebert, who has treated this subject probably more fully than any other writer, in his article, "Ueber Gehirnabscesse," in Virchow's *Archiv*, gives the proportion, based upon 80 cases of cerebral abscess, as one in 4. I believe, however, with Dr. von Tröltzsch, that "when we review the cases dispersed in the special aural literature, the conclusion must be arrived at that ear affections constitute far more frequently, perhaps in a half of the cases, the exciting cause of abscess in the brain."

There is no doubt that hitherto, in *post-mortem* examinations, the hearing organ has generally been overlooked in consequence of the difficulty of opening the middle ear, but my friend Dr. Foulis has inaugurated a new era in the section of the ear after death as a matter of routine in *post-mortem* examination. By his very ready and expeditious method the middle ear can be opened without the removal of the temporal bone from the skull, and its condition very fairly seen. It is to be hoped that Dr. Foulis, with his unsurpassed opportunities in the Glasgow Royal Infirmary, will be able to add very materially to our knowledge of the pathology of this organ. I think it is probable that persons often die of cerebral disease originating in the ear, while its aural origin has been undetected in consequence of the friends of the patient not deeming

the "running ear" worthy of being mentioned to the medical man. Besides, we must bear in mind that cases are on record where no discharge appeared from the ear, the matter escaping by the Eustachian tube.

In these three cases, which I have brought before you to-night, there are a few points to which I beg to direct your attention.

1. *The Origin and Course of the Ear Affection.*—Two arose out of measles, in the one the discharge had lasted for ten years, and in the other for four years. One was evidently catarrhal in its origin, and had a history of only two years discharge. It is well known that the most serious cases of suppuration of the ear are sequelæ of measles or scarlet fever. In all, the discharge was fetid, not, as these cases prove, a true indication of caries. *Fœtor* from an ear discharge simply means retention and decomposition of the pus. The family history was strumous or tubercular, unless in the first case, which had the most acute, or, as we may say, sthenic course. No proper treatment had been adopted for the otorrhœa in any of the cases.

2. *In Regard to the Beginning of the Cerebral Disease.*—We know that abscess in the brain has often a latent course, that extensive destruction of the brain may take place without there being any symptom of cerebral disease. In the second case, the abscess had evidently existed for some weeks or months before the acute symptoms began, judging from the appearance of the walls of the abscess. The only symptom manifested during that time having been occasional pain in the head. In all three, the onset of the acute symptoms was signalled by pain in the head. In the first case, this symptom was most intense, and continued till the last day, when convulsions and coma set in, and terminated life. In all three, the pain was localised in the same side as the ear disease. In the second case, where the caries existed, there was least pain, and in the third case, the pain was chiefly in the mastoid region, corresponding with the seat of the abscess, and also in the back of the head. Lebert observes that when the abscess is in the cerebellum, the pain often extends to the back of the head. Pain in the head is a most important symptom in abscess of the brain, and existed in two-thirds of Lebert's 80 cases. In one of the above cases, the most acute, the pain began after a blow on the head. Writers refer to the dangers of injury in chronic ear discharge. Vomiting was present at the commencement in all three cases. It was most prolonged and violent in the first, and also in the third, where the abscess

was due to inflammation of the dura mater. Recorded cases show that vomiting occurs in only a fourth of the number, and therefore it is not so constant a symptom as pain.

3. *Disturbance of the Intelligence.*—There is probably less disturbance of the intelligence in cerebral abscess than in any other disease of the brain. There was no delirium except in the last case, where the dura mater was mainly involved, and the pressure of the abscess was exerted upon the cerebellum. Only in a fourth of Lebert's cases was there distinct delirium.

I have not seen, in any recorded cases of cerebral abscess, aphasia as one of the phenomena. In the second case, where this symptom was noticed, the convolution of Broca was not involved directly in the abscess, but probably the compression exercised on this part by the collection of matter in the immediate vicinity accounted for its function being involved.

Drowsiness, stupor, and coma, are frequent phenomena observed in intra-cranial abscess. In all my cases death took place by coma. In the first, an epileptiform convulsion ended life after two weeks of great excitement. In the other two, where the constitutional condition was not so good, the cerebral symptoms were more those of depression. The drowsiness and stupor were marked, and, instead of distinct convulsive attacks, there were general tremors, more like shivering, along with coma. In the third, the frequent repetition of this comatose condition, with intervals of consciousness, was a noteworthy feature. Paralytic phenomena were observed in one only. It was hemiplegia, and followed the aphasia and the comatose seizure. The convulsions of cerebral abscess have been observed to be much more inclined to be local than to be general.

The duration of the acute cerebral disease was, respectively, eleven, thirteen, and twenty-one days. Lebert's cases ranged from two to three weeks. The ages of my patients were 12, 14, and 17 years. The half of Lebert's cases were between 15 and 30 years of age. Cerebral abscess predominates in earlier life, the period when suppurative ear diseases are much more frequently met with. It is also noteworthy that twice as many cases occur in males as in females.

With respect to the condition of the parts found after death, you will have noticed that in one case only were there carious openings between the pus secreting cavities of the middle ear and the dura mater. The most common situation for caries in such cases is the roof of the middle ear and the inner wall of the mastoid process. My second case had carious openings in these two situations. It has,

however, been long established by numerous observations in the dead body, that suppurative diseases of the ear may bring about a fatal issue, without a carious affection. The disease may be conducted to the dura mater by the numerous foramina in the bone, for the passage of vessels, nerves, and connective tissue; or, if by destruction of the two fenestral membranes, the vestibule and cochlea are invaded by the disease, there would then lie, between the seat of the inflammation and the meninges, only the perforated lamella of bone through which the fibres of the auditory nerve pass. In all three cases the dura mater was thickened and softened, over the tegmen tympani in the first case, over the carious openings in the second, and over the inner surface of the mastoid process in the third. In the formation of such abscesses, the affection of the dura mater is probably the primary condition. It is to be remembered that the blood supply to the middle ear is derived, in part, from within the cranium, and the veins which carry away the effete matters from the ear pass partly inwards through the bone to the dura mater. There may be readily developed, out of the diseased condition of the ear, morbid changes in the walls of the vessels, which, by passing along to the dura mater, may set up inflammation of that membrane, or to the sinuses, may excite phlebitis, with the attendant danger of the formation of thrombi and purulent depositions in other organs; then there is the possible introduction into the blood-vessels of the purulent matter with bacteria, and the disastrous consequences to the general organism which would thereby ensue. After the dura mater is involved, the inflammatory condition probably passes to the brain by contiguity of tissue, as there is no direct vascular or lymphatic connection between the dura mater and the substance of the brain.

How is the great factor of the pus in the brain to be accounted for? How do the bacteria get admission to the purulent matter when there is no actual opening in the dura mater or bone, and no direct vascular connection? These are questions regarding which I should gladly hear the views of any member of the Society, and especially of Dr. Coats and Dr. Foulis; also, how the extension from the middle ear of the suppurative process takes place, when a portion of healthy brain substance intervenes between the dura mater and the abscess.

ON THE ANATOMICAL CHANGES INDUCED AT THE
ELBOW BY LUXATION BACKWARDS OF THE
HEAD OF THE RADIUS IN EARLY LIFE.

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(With Lithographed Plate.)

IN winter session, 1877-8, a male subject brought into the anatomical rooms of this University presented, amongst other abnormalities,* a very remarkable condition of both elbow joints.

Before undergoing the process of dissection, it was quite apparent that some deformity existed, both arms being in a semi-flexed and a rigid semi-pronated position, but this was at the time attributed to some rheumatic cause, especially as the subject was considerably more than middle aged, and, as a result of this misconception, there was unfortunately neither a cast nor any notes taken of the condition of the external appearances. However, as some care was bestowed in observing the peculiarities met with in the dissection of the left limb, and the osseous parts were afterwards carefully macerated, it is to be hoped that the following description will suffice.

I. RECENT STATE.—The only movements allowed at the elbow joint were flexion and extension, but while flexion was as free as is usual in ordinary cases, extension was checked when the forearm formed a right angle with the upper part of the limb. On account of pronation and supination being inadmissible, the muscles which simply produce these movements, and nothing else, were unrepresented—viz., the *supinator brevis* and *pronator quadratus*; while the *supinator longus* and *pronator radii teres*, being used as flexors, were developed in the same proportion as the other muscles of the limb. Ligamentous fibres surrounded the joint, forming a firm capsule, but there was no representative of the orbicular ligament of the radius.

II. OSTEOLOGY.—The condition of the osseous parts explains the foregoing peculiarities. We shall begin with the description of the bones of the forearm.

A. *Radius and Ulna*.—One of the principal and most

* The principal additional abnormalities were—a well developed bi-lateral *sternalis brutorum* muscle, and on each side also there was a well marked example of the *subscapulo-humeralis* which was supplied by a twig of the circumflex nerve. The kidneys presented well marked lobulation, and the right one was placed low down in the pelvis, receiving its arterial supply from below the level of the inferior mesenteric.

striking abnormal features exists at the upper ends of these bones, they are ankylosed together superiorly in the position which they normally bear to one another in pronation, this at once explaining the impossibility of supination. More particularly, this fusion is to the extent of three inches, extending inferiorly to below a roughness on the radius, which is the sole representative of the bicipital tuberosity, and superiorly to the summit of the head of that bone, which, instead of reaching only to the level of the coronoid process is prolonged upwards on the outside of the olecranon, behind and beyond the normal position of the lesser sigmoid cavity, to near the summit of the ulna.

Below the point of fusion the shaft of the radius is very much thickened, being as thick throughout as at its carpal end, but it is not otherwise abnormal. On the other hand, the shaft of the ulna is exceedingly diminished in thickness, and is of uniform slenderness the whole way down. The carpal ends of both bones are normal and quite free from one another.

The great sigmoid cavity is increased in width, and is slightly concave transversely. The increase in width is best marked in the coronoid portion, where there is a prominent lip of bone extending outwards in front of that part which corresponds with the neck of the radius. The lesser sigmoid cavity is absent, the portion of the coronoid process which should bear it taking part in the ankylosis between the bones.

The head of the radius is represented by a small, rough, irregularly rounded prominence, which seems not to be so intimately fused with the adjacent part of the ulna as the parts beneath it. A shallow groove circumscribes its upper margin internally, and its anterior surface bears a flat articular facet, which encroaches partly on the neck, and whose importance is to be seen later on.

The lower portion of the fused parts seems to be made up of the bicipital tuberosity of the radius and that part of the ulna subjacent to the roughness for the *brachialis anticus*—in fact, the parts that are in the normal arm on the same level. The part between this and the head of the radius is the neck of that bone, flattened up against the ulna and fused with it. It measures $1\frac{1}{2}$ inches, that is, exactly twice the length of the normal radial neck.

B. *Humerus*.—The lower end exhibits the chief peculiarity. The bone under consideration belongs to the left arm, but, when it is placed side by side with a normal left humerus of the same size, the upper ends of both being covered and only

the anterior surfaces of their lower thirds exposed, they present the same appearance as the humeri of one subject. The articular surfaces are so altered as to furnish no guide, and the fallacy is only made apparent by uncovering their upper parts, and taking cognizance of the bones in their entire lengths. To understand the meaning of the deceptive appearance it is necessary to articulate the bones at the elbow. It is then found that only the ulna comes in contact with the humerus, and the humeral trochlear surface has its inner lip flattened and apparently worn down to the level of the lower edge of the internal supracondyloid eminence. The outer lip of the trochlea is normal, but the flattening of the inner lip is so great that the pulley-like surface is imperfectly represented. The outer condyle projects far below the inner; this, of course, is partly due to the flattening of the inner lip of the trochlea, but principally to increased downward growth.

That there is such increased downward growth at the outer condyle, distinct from the apparent elongation due to wearing down on the inner side, is a very remarkable circumstance, and easily verified. Its precise amount can be ascertained by the following mode of measurement, suggested by Professor Cleland:—First, the normal humerus is taken, and its posterior surface applied to a straight line drawn on a table, in such a way that the axis of the shaft of the bone and the line correspond. A pin is stuck in the table at the lower edge of the inner epicondyle, and another on the opposite side at a slight rough mark near the lower part of the external supracondyloid ridge, which indicates the place of junction of epiphysis and diaphysis externally. The two pins being left in the table, the normal humerus is removed, and its place supplied by the abnormal specimen, its shaft being adapted to the line as in the first instance. It is then found that, when the inner condyle touches the pin on its side, the little roughness on the external supracondyloid ridge is half-an-inch below the other; this indicating that an increased longitudinal growth to that extent took place in the outer part of the diaphysis of the bone.

Strictly speaking, the capitellum is not absent, but it is altered in shape, presenting the same appearance as the front of the normal inner lip of the trochlea. This altered surface comes in contact in extreme flexion with the flat surface of the anterior portion of the head and subjacent part of the neck of the radius already described.

When the humerus is viewed directly from behind, no part of the trochlea can be seen; and, although there is an

olecranon fossa, it is so very shallow that the septum separating it from the coronoid fossa is a third of an inch in thickness.

As regards the prominences which the bones make at the elbow, when articulated, that of the external condyle is the greatest; the inner condyloid prominence comes next in point of size, and the olecranon is least prominent. The great magnitude of the prominence formed by the external condyle is due to growth outwards, as well as the downward growth above mentioned; but, also, it is dependent, to a great extent, on the inward position of the upper end of the radius. This great alteration in the proportions borne by the prominences to one another, gives additional cause for the regret expressed at the outset, that there is no permanent record of the condition of the superficies; but it may be conjectured that the soft parts did not materially alter them.

The same condition of parts existed in the limb of the right side, but unfortunately the specimen is not now forthcoming.

On comparison with recorded cases, it becomes obvious that the altered conditions in both arms were brought about by dislocation backwards of the head of the radius in early life. The radial head slipped behind the external condyle, and, as the greatly increased length of its neck indicates, grew at a rate greater than normal when not subjected to the pressure of the humerus; also, for a similar reason, the outer condyle of the humerus grew downwards more than the inner, which was pressed on by the ulna.

The other osseous changes may be said to be of a reparative character. The shocks normally transmitted by the radius to the capitellum are, on the *point d'appui* of the head of that bone being removed from the humerus, then transmitted through the ankylosed parts to the upper end of the ulna, and so upwards to the inner side of the humerus. Then, as the upper end of the ulna has more work thrown on it than usual, it becomes enlarged transversely, this also having the effect of giving the necessary stability to the elbow joint. But as the ankylosis of the bones amounts to the substitution of a rigid uniting medium for the more elastic ligamentous one, so, instead of some of the pressure received by the radius being transferred to the lower end of the ulna by the uniting ligaments, all the shocks pass from the lower end of the radius up through its own shaft to cross at the ankylosis; this mode of transmission accounting for the hypertrophy of the radial shaft while the ulnar one becomes atrophied.

There are several cases on record of alterations at the elbow

caused by dislocation backwards of the head of the radius in early life. Dupuytren* has described two cases; in each the affection was bi-lateral, and the neck of the radius greatly increased in length, but both bones of the forearm were quite free in their entirety.

Cruveilhier† has also described two similar cases which he observed.

R. Adams‡ rather minutely describes a specimen which exists in the Dublin College of Surgeons' Museum, and refers to another one which he saw in Guy's Hospital.§ Both cases seem to be exactly similar to those described by Dupuytren and Cruveilhier, and, like them, are also somewhat different from that described now.

In Adams' case the capitellum is altogether absent, the trochlea extending right across the whole width of the humerus, and the great sigmoid cavity of the ulna being correspondingly wide. The radial neck is twice its ordinary length, and reaches almost to the summit of the olecranon. There is, however, no fusion of radius and ulna, nor is there mention made of any change existing in the lower end of the humerus beyond a flattening of the inner lip of the trochlea.

The only instance on record of a specimen similar to that now under consideration, is one described and figured by Sandifort, so long ago as 1793.|| In his case, the bones of the arm are ankylosed at their upper ends in the position of pronation; the head of the radius reaches above the back of the external condyle, and is almost on a level with the summit of the olecranon; the capitellum is absent, and the great sigmoid cavity greatly widened to articulate with the trochlear surface of the humerus, which extends equally on both condyles, and has both of its lips equally prominent. There is also an increase of the radial and a diminution of the ulnar shafts. In all respects but one, this case agrees with that before us, the difference is in the absence of elongation of the outer condyle of the humerus, but, as will be seen directly, this feature adds additional interest to the case, and serves to elucidate a problem of difficult solution.

Regarding the etiology of these peculiar conditions, all

* *Injuries and Diseases of Bones.* Sydenham Society's Translation, p. 117.

† *Anatomie Pathologique.* Tome i, p. 479.

‡ Todd's *Cyclopaedia of Anatomy and Physiology*, under article "Elbow" (Abnormal Anat. of.)

§ It may be mentioned that a specimen of the same sort exists in the osteological collection of the Anatomical Museum of this University.

|| *Museum Anatomicum.* Table ciii, figs. 2, et seq.

observers are agreed that they are the result of dislocation in early life, but there is a difficulty in determining if this luxation took place prior or subsequent to birth. The statements of different authors concerning this point are very conflicting, for, while on the one hand Dupuytren inclines to the belief that they are congenital, Cruveilhier denies that they had such an origin. Adams, speaking of the specimen which he describes, and reviewing the cases of Dupuytren and Cruveilhier, believes with Dupuytren in their production during intra-uterine life. He is led to form this opinion, partly from the affection being bi-lateral, but principally from the alteration and great elongation which the neck of the radius had undergone, a similar elongation taking place in cases of undoubted congenital dislocation, *e.g.*, the lower end of the ulna in congenital dislocation of the wrist.

In the present instance, those arguments of Adams, in favour of the congenital origin of the dislocation are applicable, and more might be added on the same side. For, not only have we the great elongation of the radial neck, but also a proportionate increase in the length of the outer part of the humerus, and an ankylosis between the bones of the forearm more perfect than that which usually takes place between well formed bones; also, the great alteration of the radial and ulnar shafts might be placed in the same category.

To some these arguments may suffice for absolute proof of the congenital origin of such cases; but it is to be considered that at birth, and for a long time after, a thick layer of cartilage separates the diaphysis from the epiphysis of all long bones, and it is no doubt as likely then as before to undergo great proliferation, when relieved from pressure, resulting in abnormal increase in length of bone. Also, as the upper ends of the radial and ulnar shafts can be approximated by artificial dislocation of the head of the radius backwards and pronation of the limb, one has no difficulty in understanding how fusion of the two elements would result, no matter whether their close relationship was occasioned, *ante* or *post-partum*. Remembering all this, and, at the same time, not denying that there is a good deal to be said in favour of the congenital origin of the deformity, one is able to appreciate the danger of dogmatising on such a subject of inquiry.

Apart from the question of the congenital or non-congenital origin of the dislocation, another problem may present itself for solution, suggested by the fact of the growth of the dis-

placed bones (radius and outer part of humerus) beyond their normal levels.

The line which this second inquiry takes is concerning the influence, if any, that bones, when articulated, mutually exercise on the growth of the parts beyond their surfaces of contact. It may be asked, Do neighbouring bones check the growth of each other, and is this stunted growth fully developed only when the bones happen to slip past one another? Judging from what is so apparent in this specimen, we are led to believe that such is the case, and, although no increase in the length of the humerus is recorded in other specimens, this exceptional instance of its increase, accompanying that of the radius, tends greatly in our present line of inquiry to enable us to give the affirmative to this question.

From the description given above, it is seen that, although the trochlea is widened, it does not encroach on the external condyle, and only slightly interferes with the capitellum. In the other cases the trochlea is described as extending right across the humerus, totally effacing the capitellum, the great sigmoid cavity being correspondingly increased in width and pressing against both condyles equally. As this has been the case in Sandifort's specimen, which, in other respects, is so like the present one, it is selected for comparison, as we are the better able to judge of the consequences of the discrepancy between them. It is seen, on comparison of the two cases, that where the ulna spread laterally and came in contact with both humeral condyles, one was as prominent as the other; but where the lateral increase of the articular part of the ulna was not so great, the outer condyle, being free, projected, *i.e.*, grew, considerably below the inner.

It may be added, in conclusion, that however forcibly this comparison may strike the observer, it still requires the aid of experiment before it can be laid down as a definite law that the growth of a bone is checked by the pressure of neighbouring ones.

DESCRIPTION OF PLATE.

Fig. 1. Radius and ulna seen from the inside.

Fig. 2. Same specimen, anterior aspect.

Fig. 3. Abnormal humerus, front view: dotted line opposite the rough mark on external supracondyloid ridge referred to in the text.

Fig. 4. Lower end of same from behind.

Fig. 5. Lower end of normal humerus, for contrasting with Fig. 3, the dotted line being placed opposite the corresponding rough mark on outer epicondyloid ridge.

A CASE OF RETRACTION OF BOTH TESTICLES.

UNDER THE CARE OF DR. A. WEST, SYDNEY.

REPORTED BY ALEX. F. BECK, GLASGOW.

THE following case of this rare affection was seen by me when on a visit to Sydney. The facts are so obvious and the condition so clear that it seems worth placing on record.

Charles Reid, 20, messenger, Sydney, N.S.W., about the middle of September, 1879, contracted gonorrhœa. Had no treatment except copaiva mixture. A fortnight afterwards he noticed that the left side of the scrotum had become somewhat flaccid and shrunken. On 14th October, while endeavouring to lift a bag of linseed, weighing 112 lbs., on to a cask, it slipped from his hands, and in the effort to keep it from falling he felt a strain in his back, and says he felt something give way. On examination he discovered that the left testicle had disappeared. Felt rather sick, but continued to go about, and two days afterwards he found that the right testicle had also disappeared. He thinks it must have gone about a day before he noticed it. Felt very weak and sick, and went to bed. Was then seen by Dr. A. A. West, who found total absence of both testicles, the scrotum being retracted and tense and smooth. Dr. West was at first doubtful whether the testicles had ever come down into scrotum, until positively assured that both had always been present. There was a large conical swelling in left iliac region, 3 inches diameter, very painful to the touch. Skin over it of natural colour, and giving dull note on percussion. Ice was applied, and patient kept perfectly quiet, and freely purged. The ice was kept on for six days, the swelling gradually diminishing, and the pain decreasing. The right testicle could be felt gradually descending into the scrotum. About 28th or 29th October it had fairly come down into the scrotum, and the sickness having left him, the patient resumed his usual work. Up to 9th January, 1880, the left testicle had not come down, the swelling in the left iliac region remaining about the same in diameter, though not quite so prominent, more flattened and fluctuating; and the dull note which it gave on percussion had gradually given place to a clear note. The finger could be easily introduced into left ring. There is great thickening of right cord, and scrotum greatly retracted though soft. The testicle slips away from under the finger when grasped. The patient says that it is occasionally drawn up into abdomen, and comes

down again without causing him any sickness or inconvenience. Has had slight aching in the loins ever since the accident. Has lost 8 or 9 lbs. in weight, and looks rather anaemic. The urethral discharge had only yielded to treatment about a week after getting out of bed.

REVIEWS.

Pharmacology and Therapeutics; or, Medicine Past and Present. The Goulstonian Lectures, delivered before the Royal College of Physicians in 1877. By T. LAUDER BRUNTON, M.D., F.R.C.P., F.R.S., Assistant Physician and Lecturer on *Materia Medica and Therapeutics* at St. Bartholomew's Hospital. London: Macmillan & Co. 1880.

THIS little book opens with a slight sketch of the history of medicine, the first four chapters being occupied with this inquiry, preparatory to the exposition of the methods of modern pharmacology, which the author attributes to Magendie and his pupils. We are glad to find in a work of a practical nature like this, that the importance of historical inquiries is thus recognised; for we believe that the experience of the past, and the history of the erroneous methods and doctrines long rampant in medicine, may be applied usefully in checking the tendency to similar errors now. Dr. Brunton points out the reason which we have for trusting our recent and present views as compared with the older ones, inasmuch as our present methods are founded on carefully observed facts checked by experimental inquiries: our interpretations of the facts may, indeed, be wrong, but with proper care in the experimental methods the facts themselves must always stand.

In a series of chapters dealing with the functions of Circulation, Respiration, and Digestion, the author shows how physiological knowledge, pharmacological investigations, and clinical diagnosis and experience must all be brought to bear on the successful treatment of disease.

In an earlier portion of the work he shows the methods by which the special actions of a drug are investigated; and amongst the illustrations the most interesting is supplied by his study of the Casca bark or Ordeal poison of Old Calabar. The author thinks that this may now prove to be a useful remedial agent.

While admitting freely the service which pharmacology has rendered and is rendering to practical medicine, we think the great benefit is in explaining the action of remedies, suggesting modifications in the doses used, and affording hints for new applications or even new remedies. The reality of these remedial agencies must always be carefully tested by clinical experience; and no remedy found, empirically, to be useful can be safely set aside simply because the most recent experiments seem to point to its action being totally different from what has been supposed. Dr. Brunton refers to one of the well known illustrations. "Rutherford has shown that podophyllin, rhubarb, aloes, and colchicum increase the secretion of bile; but he, as well as the Edinburgh Committee, of which he formed a member, found that calomel does not. The benefit which follows a dose of calomel or blue pill in biliousness, is so marked that the discrepancy between clinical observation and the results of experiment led many to believe that the latter were worthless and misleading. But facts never contradict one another, although they may run counter to our opinions. The apparent contradiction in this case may be explained by the farther experiments of Lussana, Schiff, and Heidenhain. These physiologists have found that the liver does not only form new bile, it again secretes old bile which has been absorbed from the intestine. Thus, all purgatives, which sweep out old bile and food from the intestine (and thus prevent its absorption) lessen the quantity circulating in the blood, whether they increase the activity of the liver or not." He then goes on to explain that calomel no doubt acts on the duodenum, and in this way has cholagogue properties which sulphate of magnesia wants. But in the absence of this knowledge of the "farther experiments" referred to, the result of new methods might be to deprive the slave of scientific pharmacology of a remedy really useful and tested by experience. It is all very well to say that more recent physiological researches explain the apparent contradiction; but who knows how far our present physiological views may be modified during the next ten years?

Another striking illustration of the contradictory results of pharmacological inquiry is found in the case of digitalis, which is sometimes useful in cardiac disease, sometimes useless, and sometimes apparently distinctly injurious. According to pharmacology digitalis seems to be distinctly contra-indicated, as injurious, in cases of aortic regurgitation, unless in the later stages, when the strain has been transmitted back to the right ventricle (Brunton), or when the hypertrophy is failing and

the heart walls undergoing decay by fatty degeneration are once more yielding to the distending force (Fothergill) : even these reservations are not quite in agreement, and the whole is in striking contrast to the views of Dr. George Balfour, who recommends this remedy strongly in this very form of cardiac disease. It is quite possible that some explanation of such differences in opinion may be supplied by further discoveries ; but in the meantime we have to treat our patients according to the best of our ability, and we must not allow our opinions to be dominated by experimental researches on the physiological action of the drug on animals, if clinical experience does not coincide with the results thus obtained.

One cannot read such lectures as those now under review without feeling that therapeutics and pharmacology are advancing in a new and hopeful direction, and that the advances made are of a solid kind. The interpretation of the facts ascertained may, of course, be made differently by different minds ; and the application of the results to the complex phenomena of disease, with all the uncertainties still attaching to diagnosis and pathology, must often be still like a groping in the dark. If we would avoid the fallacies into which so many generations have fallen we must ever hold our facts with a firm grasp and be ready to give up our explanations of them, however plausible, when they seem no longer tenable ; and in the practical application of our art we must ever be guided by clinical experience rather than the most brilliant theoretical speculations or the most dogmatic teaching.

The Hypodermic Injection of Morphia; its History, Advantages and Dangers. (Based on the experience of 360 Physicians). By H. H. KANE, M.D. New York: Birmingham & Co. 1880.

THE first point to notice with regard to this book is the statement in the preface that the form of the word "Hypodermic" is wrong, and that according to the usage of the language, in derivatives from the Greek, we should have "Hypodermatic," just as we have *dogmatic*, *rheumatic*, &c. This opinion rests on the authority of Professor Lewis R. Packard, of Yale College. This change the author proposes to introduce in his next edition. In view of this straining after accuracy in classical matters, we are somewhat surprised to read, in at least two passages, of morphia being given *per orem* !

The author of this volume is by no means an extreme advocate of hypodermic medication. A large part of the work, and the part which is most interesting, is taken up with a discussion of the various accidents which have resulted in carrying out this form of treatment. Syncope, narcotism, and death supply the subject for long and very interesting and instructive sections, illustrated as they are by numerous cases from various correspondents, some of whom communicate the facts anonymously.

The alarming accidents sometimes developed immediately after the injection of morphia are ascribed by the author to the introduction of the medicine into a vein, and the rapid effect of the morphia thereby produced. He discusses the question as to whether these accidents may not be due to air or fluid entering a vein. He says:—"To settle this matter I purposely injected into the median cephalic vein of my own arm twice as much air as this (*i.e.*, than the small quantity sometimes left with the fluid in a hypodermic syringe) with a solution of warm water, and without any bad effects—in fact, no effect whatever. My arm above the point of puncture was protected by a ligature that could have been drawn tight at a moment's notice, had there been any untoward symptoms. The following day I injected the $\frac{1}{8}$ of a grain of the sulphate of morphia into another vein, with the effect of producing sudden dizziness, a feeling as if the head would burst, prickling and tingling of the nose, suffusion of the face and eyeballs, dilatation of the pupils, faintness, and nausea."

The sentence in the above extract about the ligature being ready may strike the reader as peculiar, as one would suppose that whether the mischief arose from air, fluid, or morphia entering a vein, the tightening of the ligature would come too late, even if applied at the first moment of the warning from unpleasant effects. The author, however, gives some details of cases where this appliance, made on the spur of the moment, and without taking time to consider its probable futility, had apparently saved the life of the patient; and he thinks so highly of it that he recommends a suitable tourniquet to be carried with the hypodermic syringe. He likewise adduces in support of its use some evidence from Bernard's experiments with curare; the poison was "injected into the paw, and in 20 minutes the animal fell on its side. The paw was now firmly tied, and at the end of about 20 minutes the animal rose. Whenever the ligature was loosened he again fell down, sometimes at the end of 10 minutes and sometimes in a shorter period." Although this has no doubt an impor-

tant bearing on the use of subcutaneous injections, it seems scarcely to apply to those alarming cases of syncope due to the direct entrance of the material into a vein of some size.

An interesting portion of the records given by our author deals with the method of treatment of morphia narcosis by the administration of belladonna or atropine. In some of the cases the recovery seemed to be assisted by this drug, but in others there was a strong suspicion that the death had resulted not from the poison, but from the antidote!

Amongst other accidents from the use of hypodermic injections, we find cases of abscess, and even of tetanus, here narrated, and the development of the habit of using strong injections of morphia is dealt with at some length. Not a few of the victims of this habit seem to be members of the medical profession. The author gives some judicious advice with the view of preventing these unfortunate results.

There is no doubt that this volume contains a great deal of matter well suited for instructing and warning the reader. The communications, sometimes made at second hand, often referring to cases which occurred many years before they were committed to writing, and many of them deficient in accurate details as to quantities, time, and circumstance, are of very unequal value, and might with advantage, in any subsequent edition, be curtailed or condensed. We hope, indeed, that in this way, and by means of further inquiry into some of the more interesting points, such as the influence of hypodermic injections of morphia in renal disease, or in cases with renal complications, the author may produce in his next issue a work of more enduring interest than he has been able to supply from the first working up of his voluminous, but somewhat rough materials.

A Handbook of Therapeutics. By SYDNEY RINGER, M.D.
Eighth edition. London: H. K. Lewis. 1880.

OF late, new editions of this Handbook have appeared with extraordinary rapidity. The preface to the sixth edition is dated October, 1877, and now we have before us the eighth. In our notice of the seventh edition, a few months ago, we called attention to some changes of importance which had been introduced in the earlier portions of the volume. The present issue does not differ materially from its predecessor, although we notice that it contains a few more pages. Such rapid issues are not of course favourable to serious changes or reconstruc-

tion of the text, and it is probably on this account that we find in the section on Carbolic Acid, minute directions as to Mr. Lister's lac plaster as if he were still in the habit of using this preparation. His present methods are, however, also referred to. We see no notice of thymol and its uses.

The reputation of this Handbook is now so great that we need only call attention to this fresh issue.

St. George's Hospital Reports. Edited by Wm. HOWSHIP DICKINSON, M.D., and THOS. PICKERING PICK, F.R.C.S. Vol. IX, 1877-78. London: J. & A. Churchill. 1879.

It is stated in the preface to these reports that "the main object for which the work was originally undertaken was that it might be the means of registering the experience acquired within the hospital." Such an object is surely a most commendable one, and if faithfully kept in view, must be a healthy stimulus to the working staff of the hospital. The articles published are in two forms. In the first place we have reports from the various departments of the hospital—medical, surgical, pathological, obstetrical, &c., and these are of undoubted value, mainly from the statistical point of view. In addition, we have original papers, partly from the medical staff and partly from former pupils. These papers are of various value, and are mostly based on the experience gained in the hospital. The whole forms a handsome volume of over 800 pages.

Saint Thomas' Hospital Reports. New Series. Edited by DR. ROBERT CORY and MR. FRANCIS MASON. Vol. IX. London: J. & A. Churchill. 1879.

THIS volume consists mainly of original papers by the staff of the hospital, and some of these are of considerable value. We may note the following as of directly practical bearing:—The treatment of epithelioma of the uterus by erosion, by Dr. Gervis. Remarks on a few cases of strangulated hernia, by Mr. Clutton. The salicylates of calcium and bismuth in the diarrhoea of children, by Mr. Kilner. Notes on the diagnosis of tobacco amblyopia, by Mr. Nettleship. Baths in hyperpyrexia, by Dr. Ord. Cases of chorea, by Dr. Bristowe.

Montreal General Hospital—Reports Clinical and Pathological, by the Medical Staff. Edited by WM. OSLER, M.D., M.R.C.P., Lond. Vol. I. Montreal. 1880.

WE have to congratulate our Canadian brethren on the appearance of this, the first volume of the reports of the Montreal General Hospital. The papers contained in it are of a high order of merit, and the entire volume shows a style and amount of work which augurs well for the teaching in the M'Gill University of Montreal, in which most of the staff of the hospital are teachers. We notice that several of the papers are illustrated by lithographs of very good execution, and observe that there are indications here of the introduction of the metric system into Canada. We believe that it is already extensively used in the United States.

Notes on Fever Nursing. By JAMES W. ALLAN, M.B. London: J. & A. Churchill. 1879.

DR. ALLAN'S work contains, in moderate compass, a full and well arranged exposition of the ordinary duties of a "fever-nurse." The first chapter advises as to her personal qualifications and deportment; the second treats of the ventilation, temperature, and general management of the ward or sick-room; the third shows how to make such brief clinical records as a nurse might undertake, teaches the use of the clinical thermometer, and has several pages on the various methods of dealing with the symptoms and complications usually met with in severe febrile illness. The succeeding chapters contain clear and plain descriptions of the leading symptoms of typhus, enteric fever, and scarlet fever; the distinctive features of each are pointed out, and there are ample details with respect to the nursing, especially in regard of nourishment and feeding, mechanical restraint in delirium, bedsore, and scarlatinal dropsy. Then follow brief sketches of relapsing, intermittent, and yellow fever; and the work concludes with a short chapter on disinfection.

We have read Dr. Allan's work with much pleasure, and can warmly recommend it to our readers. Its teaching is reliable, and well suited to the requirements and the comprehension of nurses in general. Many of the suggestions might also have an interest for practitioners in the numerous instances where the services of a trained nurse are not available, by refreshing the memory on matters of detail, to which the attention of those in charge of the case should be specially

directed. We regret the absence of any allusion to measles or small-pox, which might well have taken the place of the paragraphs devoted to intermittent fever and yellow fever. Also we should have liked some directions as to the stage of convalescence at which a sick person may safely leave his bed, considering as we do that cases of scarlet fever, however mild, ought to be kept in bed up to the end of the third week, and that persons suffering from enteric fever should use only the bed-pan until convalescence is fully established. We think also that more stress should have been laid on the necessity of keeping ordinary medicines apart from liniments and disinfectants, of whose physiological activity the nurse may not be fully aware.

These matters, however, and the occasional inelegancies of the style, scarcely affect the general merit of the work, which will be readily appreciated by all those who in any capacity are engaged in the care of the sick.

REPORTS OF HOSPITAL AND PRIVATE PRACTICE.

GLASGOW ROYAL INFIRMARY.

REPORTS UNDER THE SUPERVISION OF DR. J. WALLACE ANDERSON.

FROM DR. SCOTT ORR'S WARDS.

ANEURISM OF THE THORACIC AORTA—PAIN ON PRESSURE OVER STERNUM—PARALYSIS OF LEFT VOCAL CORD.—The following case, which was under our care while *locum tenens* for Dr. Scott Orr, presents nothing that can be considered pathognomonic of this disease, but is of some interest on account of a symptom which must be of rare occurrence in *thoracic* aneurism (as distinguished from that of the arch), and which, in this connection, has not been recorded, so far as we are aware, in any of the text books or monographs on the subject.

A. B., æt. 36, admitted 8th March, 1880, complaining of cough and spit, which has troubled him for the last three or four months. The percussion note is good all over the chest, but under the clavicles the breathing is harsh. There are no râles. A few weeks later, when we assumed duty, he had a pinched and anxious look, and seemed at least ten years older

than what he said. He was very hoarse, and had a sense of obstruction to the breathing about the larynx. His cough was slight and occasional; spit, muco-purulent and not abundant. His symptoms and appearance generally suggested as a first impression laryngeal phthisis. On making a laryngoscopic examination, however, Dr. Foulis found simply paralysis of the left vocal cord. With the probability of aneurism distinctly in view, a thorough physical examination was made of the chest. Nothing positive, however, could be made out on the most careful percussion. On auscultation it was found that the laryngeal stridor was so pronounced that nothing like an exact appreciation of the condition of the chest could be expected by that method. The harsh stridulous respiration that was previously thought to be confined to the larynx was evidently now in the trachea and larger bronchi. It was too general, too near the ear (articulate, if we may so use the word), to be merely conveyed from the larynx or the trachea alone. No râles of any kind could be detected, and on the patient holding his breath, the heart sounds were ascertained to be quite normal. But in the absence of any positive sign anteriorly, there was this striking peculiarity, that pressure on the upper part of the sternum, or on the second, third, and fourth costal cartilages of the left side, always produced the most unmistakable pain and increase of the difficulty of breathing. This was first noticed on making the ordinary amount of pressure with the stethoscope, when he instinctively raised his hands as if to lift it off. The examination of his chest always increased the dyspncea. This occurred latterly without any movement on his part, so that it cannot be explained on purely mechanical grounds, or from any increased demand necessarily on the heart's action. On the 15th May, about ten days after Dr. Foulis' examination, the first alarming attack of suffocation occurred, when Mr. Jones, resident assistant, attempted to get him up for the purpose of using the laryngoscope a second time. He was suddenly seized with the most severe fit of coughing and difficulty of breathing, with great increase of the laryngeal stridor. He was evidently in great agony, his face becoming red and then livid, and bathed with perspiration. This attack gradually passed off, but afterwards attacks recurred at intervals, being brought on at times by the simple exposure of his chest to the air. They were always suffocative and never directly painful in character. On account of these attacks his chest was not so carefully examined posteriorly, and certainly no positive signs were made out. He occasionally complained of slight pain between the scapulae,

but this was never a prominent symptom till within a day or two of his death. The pupils and radial pulses were always equal, and he had no difficulty in swallowing. His cough, though latterly more severe, did not seem to pain him, and there was never any haemoptysis. The paroxysms gradually became more frequent and more severe, and at last he expired in one of them on the 22nd May.

A *post-mortem* examination was made by Dr. Foulis, and his report may be summarised as follows:—The principal lesion was an aneurism about the size of the closed fist, situated at the commencement of the thoracic aorta, opposite to, and in close contact with, the third and fourth dorsal vertebræ, the bodies of which were considerably eroded. The aneurism communicated with the aorta by an aperture as large as a sixpenny piece, and was almost entirely filled with laminated blood clot. The left recurrent laryngeal nerve was pressed on by the aneurism, and the trachea and gullet were slightly pushed to one side by the bulging of the sac. The erosion of the vertebræ did not affect the intervertebral cartilages, but involved the articulation of the ribs with the bodies. The lining membrane of the aorta had an ulcerated appearance, and was rough and irregular in its entire extent from calcareous degeneration. The heart and its valves were quite healthy. The state of the other organs of the body does not call for special remark.

From the above report one can easily understand the absence of the ordinary physical signs in the chest; and the difficulty of breathing, with the suffocative exacerbations, is equally intelligible from the pressure, or the recurrent laryngeal nerve. But the pain and increase of the dyspnoea on pressure over the sternum and costal cartilages, are even now difficult to explain. Probably the pain was owing to the movements conveyed through the ribs to the diseased costo-vertebral articulation; it is difficult to account for it in any other way. That it was a pronounced symptom is certain, whatever be the explanation; whereas the suffocative sensation was not so particularly marked, and required an amount of pressure that might be expected to induce it from his condition generally.

FROM DR. MACEWEN'S WARDS.

CASE OF EXCISION OF THE WRIST JOINT, *continued*.—At page 416 of the *Journal* for May, the case of Annie W., æt. 12, is reported. Excision of the right wrist had been per-

formed according to Lister's method, on 20th March. To-day (June 7th), eleven weeks after the operation, we saw the patient in Ward XXII, when we had the opportunity of observing what use she could make of the hand and fingers. She could lift a pin from the floor, catching it in the usual way between the point of the thumb and forefinger. A toy pianette was brought to her, and on this she could strike the notes with each finger independently, with the exception of the little finger, which could only be brought down along with the outside of the hand. Specimens of her handwriting were also shown which had been done at home during the previous week. They consisted of a few pages of strokes, hooks, and whips, which were very well formed. Of the character of her sewing we cannot be expected to form an opinion, but she had succeeded in hemming a small napkin in a manner that was considered very creditable to her.

WESTERN INFIRMARY.

REPORTS UNDER THE SUPERVISION OF DR. W. G. DUN.

FROM PROFESSOR MACLEOD'S WARDS.

TWO CASES OF MALIGNANT DISEASE.

CASE I. CANCER OF HUMERUS, ORIGINATING IN THE MEDULLA—AMPUTATION OF ARM AT SHOULDER JOINT.—The patient, aged 44, is a stout, healthy looking woman, of a highly florid complexion. She has always enjoyed good health, with the exception of two slight attacks of rheumatic fever. Her mother is said to have died at the age of fifty-six from cancer of the breast.

The first indication of any mischief in the arm was observed about a year ago, when she slightly twisted her arm in getting it into her dress, causing great pain, followed shortly by a swelling. For some weeks no particular attention was paid to the arm, but at last she consulted a medical man, who informed her that the bone was broken. A splint was applied and kept on for three weeks, at the end of which time there was no indication of union, and the swelling had in the meantime considerably increased. When admitted to the hospital on 19th May, an ununited fracture near the middle of the humerus was detected. Above this point there was a large,

smooth, firm swelling, chiefly of the upper part of the humerus, and tapering downwards towards the elbow. The glands of the axilla and neck were unaffected. Constant pain in the arm was much complained of.

The case was diagnosed as malignant disease of the humerus, and amputation at the shoulder advised. On 1st June the operation was performed. The vessels were perfectly controlled by an Esmarch band applied high up in the axilla and over the shoulder. This method, though preventing all risk of haemorrhage in stout persons like the patient, rather incommodes the operator; the fact, however, that when carefully performed, the operation becomes almost bloodless, is an undoubted advantage both to the operator and the patient. Larry's oblique operation was performed, the chief covering being taken from the external and posterior surface. The bone separated at the seat of fracture, and its articular head had to be dissected out.

The case has progressed quite satisfactorily since the operation, and the wound is now almost entirely healed.

An examination of the diseased part was made by Dr. Coats, who reports:—The upper end of the humerus is occupied by a tumour, which entirely replaces the bone for a space of three or four inches. The tumour is irregular in outline, and somewhat more bulky than the corresponding portion of bone; but it does not form a very large tumour, its entire length being about $3\frac{1}{2}$ inches and its breadth about 2. Its tissue is white in colour and remarkably firm. At its upper and lower extremities the tumour is separated from the bone by ragged fractures, so that the head of the bone was loose, and the tumour also. Under the microscope a typical cancerous structure is presented. There is a coarse connective tissue stroma often somewhat pronounced, and sometimes with spindle-shaped cells in its composition. In the meshes of the stroma are cells of a distinctly epithelial character, mostly of large size, and with large oval nuclei. Sometimes there are two nuclei in one cell, and sometimes even a cell within a cell, as one sees in scirrhus of the mamma.

We understand that Dr. Macleod had recently, in private, to remove both arms for a similar affection to the above. The second operation, performed a month after the first, proved fatal from exhaustion. Wandering pains of long continuance in the bone, followed by spontaneous fracture, and subsequently the appearance of tumours, marked the progress of the case.

CASE II. SMALL-CELLED SARCOMA OF THE LEG: AMPUTATION THROUGH KNEE JOINT.—The patient is a robust, healthy looking man of about 50 years. Like the former patient, he has had several attacks of rheumatic fever, from which he has always recovered perfectly.

About a year ago he received a very trivial blow on the outside of the left leg; some days after a tender spot was felt there, and redness of the surface observed. About a month later a slight swelling of the part was just noticed, which gradually increased until it assumed the appearance of a distinct tumour. There has never been much pain experienced, and he has all along been fit for work.

Condition of Tumour on Admission.—May, 1880. It is seated on the outer side of the leg, about the middle, and seems connected with the fibula. In outline it is nearly circular, measures about $4\frac{1}{2}$ inches across, and projects about 2 inches from the surface. The skin over it is slightly red and glazed. It is quite fixed, is of firm, tense consistence, and very little painful on pressure. The glands of the groin are not affected.

2nd June.—Ethidene dichloride administered to-day, and leg amputated through knee-joint, the patella being retained in the large anterior square flap. The articular end of the femur was left untouched, according to the method of amputation recommended by Dr. Macleod. The flaps were square,—the anterior one being long and broad enough to cover the surface of the femur, without any strain on it. The base of the anterior flap was at the level of the articulation. Skin and cellular tissue alone formed the anterior flap, which was, however, of good consistence. No saw was applied, and the encrusting cartilage was not touched.

This operation has been performed several times by Dr. Macleod, and always with good results. The condyles of the femur become absorbed, and a shapely stump is formed. The number of cases in which it is suitable is limited, as, of course, it is not permissible except where the femur is quite sound, as in cases of accident, or in such cases of disease as the present.

In the October number for 1874 of the *Glasgow Medical Journal*, Dr. Macleod contributed a paper, in which this operation is discussed at length.

The tumour was examined by Dr. Coats, who reports:—The tumour is as large as the fist, and occupies the outer aspect of the leg immediately below the knee. The muscles of the outer aspect of the leg are, to a great extent, involved in its substance, a dissection by Dr. M'Phail showing this very well. It is made out that there is no connection with the bone, but

the fibula is slightly eroded. The tumour has an irregularly lobulated outline, and is of somewhat soft consistence, although covered by a rather tense capsule. Under the microscope there are innumerable small cells, round or slightly elongated.

MEETINGS OF SOCIETIES.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.

SESSION 1879-80.

MEETING VIII.—12TH MARCH, 1880.

DR. HUGH THOMSON *in the Chair.*

DR. GLAISTER showed a HORNY EXCRESCEENCE which he had that day removed from the arm of a woman about 50 years of age.

DR. M'VAIL, Kilmarnock, read RESULTS OF SURGICAL TREATMENT, WITHOUT ANTISEPTICS, IN KILMARNOCK INFIRMARY.

Dr. M'Vail stated that, during the past three years, 543 cases had been treated by Dr. Borland. Among these 13 deaths occurred, but of the 13, 7 took place within thirteen hours after admission. Omitting these, there were 6 deaths in 537 cases. In the 537, there were 107 operations, with 3 deaths, including 26 major amputations for disease, with 1 death. The cause of death in this case had been set down as pyæmia from a large abscess over the sacrum, which arose in a strumous patient about to be dismissed after an excellent recovery from Syme's amputation. The other two deaths followed primary amputations—first, of the thigh in a man aged 76, and second, of both legs in a man aged 52 years. Death occurred on the third and seventh days respectively after operation, and was due in both cases to internal and other injuries. 8 compound fractures were treated, with no deaths; and 42 wounds, with one death from tetanus. The death from pyæmia was the only one from hospital diseases in the 537 cases. In comparing these figures with those of Dr. Cameron of the Glasgow Royal Infirmary, and of Mr. Lister's hospital practice in Edinburgh, the following were the results. Dr. Cameron's death-rate was 5·1 per cent against Dr. Borland's 2·3. Omitting moribund

cases, reduced Dr. Cameron's to 2·9, and Dr. Borland's to 1·1 per cent. Mr. Lister's mortality from operations was 4·4 per cent; Dr. Borland's, 2·8. From major amputations, Mr. Lister had 11·25 per cent of deaths to Dr. Borland's 8·8. Omitting primary cases reduced the mortality to 7·8 and 3·8 respectively. The average time between operation and dismissal by Dr. Borland was, in amputation of the thigh, 30·5 days; leg, 24·1 days; ankle, 40·7 days; foot, 42 days; arm, 13 days. Mr. Lister's mortality from wounds (including compound fractures), was 5·7 against Dr. Borland's 2 per cent. From blood poisoning, Mr. Lister had 6 deaths in 917 cases of operation, injury, &c., or '65 per cent, while Dr. Borland had 1 death in 161 similar cases, or '62 per cent. It might be urged that the results in the Kilmarnock Hospital were not comparable with those in such large institutions as the Glasgow or Edinburgh Infirmaries, but Mr. Lister himself held that a large hospital, in which there were three antiseptic surgeons, and only one practising simple surgery, was, so far as hospital diseases are concerned, practically reduced to an hospital of only one-fourth of the size. Therefore, in Mr. Lister's opinion, the surrounding conditions of his own and Dr. Cameron's cases were by no means so unlike Dr. Borland's as might at first appear. The Kilmarnock Infirmary is fitted to contain 120 beds. When patients are few, some wards are entirely closed, so that the air space per patient is not much increased.

Dr. Alexander Patterson thought the results very extraordinary, and such that Dr. Borland might well be proud of. No doubt, the number of operations was rather small. In his own lately published statistics he had 162 operations in three years, with 7 deaths. Mr. Savory, in the results which he had published, had not included ovariotomies. In his own statistics he had included them, as well as every other operation. There had been no pyæmia in his wards since they were opened. For wines and spirits his average expenditure was 7½d. per head. He had endeavoured, by direct inquiry, to ascertain Mr. Savory's rate for stimulants, but had received no reply. He had, however, since ascertained that it was 2s. 10½d. He thought that between Kilmarnock Infirmary and the Western Infirmary of Glasgow the results of surgical treatment were not fairly comparable. Still, with all the advantages accruing to the former from its purer air, he had not been prepared to hear of such results without antiseptic surgery.

Dr. Morton was not surprised at the results, and had already told Dr. Borland that he had distanced in his results all the surgeons in Glasgow. He must also congratulate his old pupil,

Dr. M'Vail, on the way in which he had stated his case, rather with the balanced judgment of a judge than the partizanship of an advocate. He held in his hand a letter from another Ayrshire surgeon, residing at a distance of some seven miles from Kilmarnock, whose treatment, without antiseptics, was even more successful than that of Dr. Borland. The total numbers were not given; but the number of major operations was 17, or, including cases of hernia, 30 cases in all, with one death, and even that death was accounted for. *Dr. Morton* read extracts from the letter, giving details of some of the cases, and especially drawing attention to the fact that in one case the material for a dressing, which necessity compelled him to improvise, consisted of a washing cloth, presumably saturated with germs. The opinion of the writer was that, whatever value antiseptics might have in surgical practice in a large city, they were unnecessary in country practice. *Dr. Morton* thereafter adverted to the recent controversy on the comparative results of antiseptic and non-antiseptic surgery in the Royal Infirmary.

Mr. John Reid was of opinion that the two modes of surgical treatment should be compared only in respect to cases of pyæmia and similar diseases alleged to be due to the absorption of germs. The other question was, Whether the antiseptic treatment of wounds tended to the more rapid healing of them? Dr. Borland's statistics were of great value as showing that as good, and better results could be got with simple dressings. The treatment of a severe wound should be, of all things, soothing; and he thought antiseptics decidedly irritating, and that the treatment retarded, instead of accelerating, cicatrisation. He had treated cases of compound fracture, such as were met with in general practice, and he never had a death. His mode was to wrap up the injured limb in its own blood—than which there could not be a more congenial application—and let it remain in this dressing as long as possible. He had often dressed a wound in a very rough and ready way, and never, in country practice, had any bad results.

Dr. Macewen said that he could say, speaking for himself, that he never had a case in which a patient became infected with erysipelas or pyæmia in his wards. No surgeon could prevent cases coming in from the outside. One such case he had lately, in which a patient was brought into his wards with several abscesses and a pyæmic look. The case was sent at once to the Erysipelas Ward. The statistics of Dr. Borland's practice were remarkably good. The number of

operations (26 in three years) was no doubt very small. As regards statistics generally, the mode of bringing forward certain figures, without any reference to the particulars of the cases, was one not likely to be of scientific value. Even in comparing the results from one hospital, there were elements of fallacy in such a calculation. Thus, in the Royal Infirmary, cases of tetanus were often taken to the wards of a particular surgeon, thus swelling his rate of mortality, as the disease was frequently fatal. He took this view of the value of statistics, though he had been told his own results were nearly on a level with those of Dr. Cameron, in the investigation recently made public. The case of pyæmia, in Dr. Borland's statistics, was a blot, as he held that this was preventible. Antiseptic surgeons were told that they must produce better results than those shown by other surgeons. To this his reply was that, in this matter of the absence of pyæmia and erysipelas, the advantage of antisepticism were demonstrated. While in the hospital as house surgeon, he had seen pyæmia frequently in the wards of a surgeon who treated his cases with the utmost care, with water dressings. He then entered in his note-book that one thing he must do was to study pyæmia carefully. He had now been surgeon in the Royal Infirmary for four years, and during that time he had never seen a case of pyæmia, or blood-poisoning, or erysipelas in his wards. Take the special subject of osteotomy. Osteotomy, as he performed it, was not a subcutaneous operation, but a real compound fracture, the air being often heard to whistle into the wound. He had now operated on more than 300 patients and 520 limbs. In a great many cases, three or four, and as many as ten osteotomies were made on one patient. The number of sections of bone would not be less than 1,000. In only three of the cases had anything untoward occurred. One patient died of diphtheria, after the wound was perfectly healed. Another case died from tubercular meningitis; and, on *post-mortem* examination, the wound was also found to be perfectly healed. In the third case he had promised to operate on a woman, and did so after a rather hurried physical examination. During the operation she coughed up sputa tinged with blood; and afterwards, on a more thorough examination, consolidation of the lung was detected. But, even apart from this explanation, four deaths out of 1,000 compound fractures, was a very small mortality. The wounds healed by vitalisation of blood clots. His wards, he might mention, were so overcrowded that the superintendent had

been always remonstrating with him, and predicting disaster which, however, had not as yet come to pass. In the total absence of all the usual pathological phenomena of hospitalism, even under conditions of overcrowding, was to be found a stronger argument for the antiseptic treatment than in an array of statistics. In regard to stimulants, he made very little use of them. He had learned that the way to produce pus was to let the patient feed on them. If Dr. Morton had perfect faith in his own practice, why was it that he performed osteotomy and tenotomy subcutaneously? Why not let in the air as he (Dr. Macewen) did in his operation for osteotomy?

Dr. D. C. M'Vail asked, if the one case of pyæmia in these statistics was a blot on Dr. Borland's practice, were Mr. Lister's cases of pyæmia equally a blot?

Dr. Goff, Bothwell, said that for 27 years he had practised surgery in the country without ever using the antiseptic method. To ride four or five miles in a country district, armed with all the appliances of that system, including spray-producer, would, in fact, be no easy task. His results had been extremely satisfactory; and this he attributed to the abundance of fresh air. In a large city, and especially in a large hospital, the antiseptic system might be required; but it was not necessary in country practice.

Dr. Morton was allowed to make an explanatory statement, in which he referred to the history of subcutaneous surgery, as promulgated in idea by John Hunter and practised by Stromeyer, long before the days of Listerism.

Dr. Murdoch Cameron could bear testimony to the pleasurable feeling experienced by him in walking through Mr. Lister's wards, when that surgeon was in Glasgow, as contrasted with his sensations in other wards.

Dr. Glaister referred to some cases of amputations of fingers and toes performed antiseptically by him, with good results, and which gave him confidence in the superiority of the system. He could also bear testimony to the fact that, in not a single instance in which he had examined the wounds in Dr. Macewen's osteotomies, had he ever seen anything but blood.

Dr. Thomson said that the antiseptic treatment of wounds had been practised from the beginning of surgery, with a view to prevent putrefaction in the wound. As to blood itself it was one of the best antiseptics. It coagulated and formed round the wound a crust which had the effect of excluding the air. In regard to the method of carrying out the treat-

ment, there could be no doubt that Listerism was very successful in preventing putrefaction in wounds. In a wound in which an operation had been performed upon bone, he had seen a clot completely organized in spite of the fact that it was penetrated by the drainage tube. While he was surgeon to the Greenock Hospital, many years ago, the amount of pyæmia was something frightful. At that time he would rather have been treated for compound fracture in the lowest hovel in the town than in hospital. When a new surgical ward was added, it was noticed that all the cases got well.

Dr. M'Vail, in reply, said that he quite agreed that the value of statistics as a test of the worth of any particular surgical practice was apt to be overrated. But whatever validity they had when used by antiseptic surgeons in favour of their own system, the same value must be attached to figures when used in favour of another system. It was to statistics that an appeal had lately been made in the Glasgow Royal Infirmary and elsewhere, to prove the excellence of antiseptic practice; and to statistics he had that evening appealed, as giving results which that practice, in Mr. Lister's own hands, had been quite unable to equal. The argument that these results were obtained in a small country hospital, if good for anything, would go to prove that antiseptics were unnecessary, except in large hospitals. Dr. MacEwen was right in calling the death from pyæmia a blot on the Kilmarnock statistics. But one death from hospital disease in 26 major amputations was by no means so great a blot as two deaths from the same cause in Mr. Lister's 38 excisions of the mamma. He might explain that in the case referred to no *post-mortem* examination was allowed, and it was with considerable doubt that the cause was set down as pyæmia. As to erysipelas, not only had no one died from it, but no one had recovered from it; there had been no case. Mr. Reid's assertion that the comparison of the results of the antiseptic and other treatment should be limited to pyæmia, would not be accepted by antiseptic surgeons themselves. Dr. Glaister's confidence in the superiority of antiseptics, based as it was on his experience of two or three amputations of fingers and toes, would seem to have been arrived at on a somewhat narrow induction of facts. It was amazing to find what a limited knowledge of what he had called septic surgery (he had used the term by the way, not as being scientifically accurate, but simply as one employed by Mr. Lister) those who had been brought up in the other faith sometimes had. A student from Edinburgh, who

visited the Kilmarnock Hospital, was at first almost horrified to find all the elaborate appliances of Listerism dispensed with. Dr. Borland's position in regard to antiseptics was simply that he had never required them. Without their aid he had achieved the results recorded that evening. Why, then, should he adopt them?

MEETING IX.—2nd APRIL, 1880.

DR. FERGUS, *President, in the Chair.*

DR. BARR read THREE CASES OF CEREBRAL DISEASE CONSEQUENT UPON PURULENT DISEASE OF THE MIDDLE EAR, with remarks. This paper appears at p. 32.

Dr. Macleod said that he would have liked that Dr. Barr had told them what to do in these cases. He had met with several of them. One was that of a boy at school who had received a trifling cut on the head from one of the ushers. Immediately after, the boy took ill, vomiting set in, and after a short period of acute suffering, he became comatose, and died from the cerebral affection. Dr. Macleod pointed out the serious forensic aspect of such a case, and then referred to three other cases in his experience, the last being that of a soldier, a young man, who had been noted as being exceedingly intelligent. He got cold, which was followed by a discharge from the ear. It was noticed that he was less intelligent than formerly, and eventually got so stupid as to be unable to discharge the official duties of an orderly. He was sent into hospital, and one day, in going about, he fell and struck his head on a fender. He had a kind of convulsion, and nearly died. But he rallied, and seemingly got considerably better, when he took another similar attack, and died. There was a suspicion that the blow on the ear was the cause of the death, but on *post-mortem* examination there was found a large old abscess with thick walls, and connected with this a purulent ear. The blow, therefore, had been a mere accident in the case. When the surgeon saw these cases they were generally beyond hope. But suppose they saw a case early, what were they to do, beyond the palliative treatment of leeches, blisters, &c.?

Dr. Gairdner said that he had never overlooked the significance of purulent ear discharge, as, at an early period of his

pathological experience, his attention had been directed to these cases. Dr. Macleod had remarked on the fact that he was generally called in when the case was hopeless. Between Dr. Macleod's experience and his own there was this difference, that the former was called in to do something of a surgical kind outside; while he (Dr. G.) was called in generally to find a state of matters which was not believed to be connected with ear discharge in any degree. A striking instance of this occurred in this way. In a case of cerebral organic disease, he was led to put the question to the patient's wife, much to her surprise, and probably also to that of his medical attendant, whether he had any ear discharge? He found that there had been intermittently a purulent discharge ever since his wife had known him. No idea of any connection between his cerebral symptoms and this aural discharge had occurred to her, or to any one about him. Dr. Gairdner referred to other cases of the kind, reading a summary of one case from the hospital records.

Dr. Smart stated that he had care of a young man about 22 years of age, who had an ear discharge from early life. The patient thought nothing of it. He took what appeared to be a bilious attack, for which he gave him a purgative. Ultimately the pain got localised in his head. He then detected a tenderness over the mastoid process,—very slight in the first instance. There was a polypus in the ear which was removed, without permanent relief. The introduction of a probe revealed nothing. The pain returned, and the puffiness became distinct. He proposed a consultation on the case; but, before this could be had, he was called out during the night to find the lad in convulsions. The puffiness had increased, and fluctuation could now be detected. He made a free incision, with manifest advantage resulting for several days; but, at the end of that time, he found him in a semi-comatose state, which ended in death in two hours. There was no *post-mortem* examination.

Dr. Foulis said that he had examined some four or five cases of cerebral abscess. The proportion of cases of ear disease present in the entire cases examined by the pathologist of an hospital was much larger than one would imagine. Out of 130 consecutive cases examined by him, he found that about 20 had distinct ear disease. The difficulty of examining the ear had hitherto prevented much attention being given to the matter. This difficulty he had now overcome. In cases of abscess of the brain the ear was frequently not examined at all. Had this organ been systematically examined, a much

larger proportion of cases of cerebral abscess connected with ear disease would have been recorded.

Dr. Hugh Thomson said that the connection between the two diseases, as cause and effect, in Dr. Barr's case, and some of the others referred to that evening, was not quite made out. The patients were generally of strumous diathesis, and it was quite possible that the two diseases might be coincident in the same case, resulting both of them from this diathesis, without either of them being caused by the other. The disease of the ear, he noticed in Dr. Barr's case, was on the same side as the cerebral abscess; but there was no direct anatomical communication from the one point to the other, as the dura mater made a complete division. He would therefore be inclined to suspend judgment on the point whether abscess of the brain might result in the way supposed.

Dr. Coats said that probably few would share the doubts expressed by Dr. Thomson as to the causative connection between disease of the ear and abscess of the brain. He (Dr. Coats) had speculated in regard to what might be the path of infection in such cases; and he would suggest that this was probably by way of the lymphatics. By this path the infective material might get into the arachnoid cavity, and travel inwards to the spaces inside the brain. He had himself seen several cases in which this had been the path followed. The abscess might be dissociated from its place of origin by a considerable portion of tissue. The localisation of brain function was at present engaging scientific attention; and he hoped that Dr. Barr, by carefully observing cerebral symptoms in such cases as came in his way, might be able to assist in this field of research. He had a case of ear disease in which abscess had formed in the soft membranes. There was a large abscess at the first part of the fissure of Sylvius, and its situation was such as to impinge on the surface of the brain, involving Broca's convolution in the lower part of the frontal lobe. This boy had, previous to his death, made a great noise in the ward, talking loudly and incessantly.

Dr. J. A. Adams stated that he had a case of a child, about six years ago, who was the subject of ear discharge. There was a slight oedema over the mastoid process. He made a slight incision, and found a piece of necrosed bone, which he was afraid to remove. There was marked relief from the incision, and after some time the bone came away with some of the mastoid cells. During the two years in which he had been in the anatomy room, he had observed the infrequency of cerebral abscess in the subjects, perhaps not more than one

case in 100. In one case there was an old abscess of the temporal lobe, with disease of the middle ear, but no necrosed bone. In these subjects there were not a few cases of disease of the middle ear.

Dr. Barr, in reply, said that in regard to the question of treatment, that was in the later stages really *nil*. Some had proposed to perforate the skull in order to reach the walls of the abscess. But, other considerations apart, it would be impossible to make sure of the position of the abscess. In regard to running ears, most of the cases would, he believed, be curable, if treated at an early stage. In regard to Dr. Adams' remarks, Grüber related a case in which the entire surface of the mastoid process came off. Dr. Smart's introduction of a probe in his case was rather dangerous practice. Dr. Barr also made a few remarks on the importance of teaching and examining students on ear diseases.

GLASGOW SOUTHERN MEDICAL SOCIETY.

SESSION 1879-80.

MEETING XI.—1st APRIL, 1880.

MR. NIVEN, *President, in the Chair.*

MR. PARK introduced a professional conversation on CIRCUMCISION AND THE ALTERNATIVE OPERATIONS. He first made some remarks on the physiology of the prepuce. This structure must now, in great measure, so far as civilised communities are concerned, be classed with those whose functional importance may be said to have passed away. Its use is not now very obvious, and the advantages of its possession are more than countervailed by its disadvantages. It is a direct predisponent to infectious diseases, especially syphilis. Still, it protects the gland from friction and injury, and this must be borne in mind by those who would remove it in the adult. As to the normal position of the prepuce in married and single, no information is to be found in books; but, from observations made on 180 patients, Mr. Park found that in not more than 8 per cent was it retracted behind the corona glandis, and in these there was either a congenitally short prepuce, or an abnormally large gland. *Abcision* is

the form of operation usually adopted in infants; here the foreskin is drawn forward and cut in front of the glans, by a single stroke of the bistoury. *Revision* is the term most applicable to the simple slitting of the prepuce on the dorsal aspect. The term *circumcision* should be applied to the operation which consists of revision and the subsequent removal of the angular flaps. It is indicated as a hygienic proceeding in all adults with a long prepuce—that is, one which, in the quiescent state, extends at least an eighth of an inch beyond the extremity of the penis; and in every case of disease in which more than the anterior part of the prepuce is involved. No special instruments are required for these operations. *Incision* may be practised when there is neither time nor opportunity to relieve phymosis in any of the ways indicated; this is performed by introducing a straight, blunt-pointed knife within the preputial orifice, and incising the mucous membrane to the depth of an eighth of an inch in four places. Or Ridreau's operation may be adopted. It is performed thus:—Stretch the prepuce by drawing the mucous membrane forward and the skin back, so as to lay bare the orifice, into which a slender cylindroconoid rod of wood is introduced; make a circular incision at about half a line from the mucous margin, dividing the skin only; the latter at once shrinks back on the glans; maintain the mucous membrane on the wooden rod, and remove by a circular incision enough of it to give free play to the glans in the aperture left; then join the edge of the skin and that of the mucous membrane by sutures. The galvanic or thermo-cautery may be required in cases of cancer of the anterior portion of the prepuce, and of condylomata or warty growths on the same part.

Hæmorrhage in these operations may be severe, and is often due to abnormal distribution of the blood-vessels; secondary hæmorrhage may occur from erection. Care must be taken not to slit the urethra. The value of circumcision, or some such operation, in preserving boys from physical and possibly from moral evil, should be strongly urged upon the attention of parents, for it is a well known fact that, amongst that numerous class who ask our aid for venereal disease, the starting point of many moral deflections has been the irritation arising from hygienic remissness.

In the absence of DR. DUNLOP his assistant, MR. JACKSON, showed a patient (a girl of 14, suffering from LATERAL CURVATURE OF THE SPINE) with a poroplastic jacket in use. He

also showed several poroplastic jackets and the apparatus for softening them before adjustment, together with the tripod and the arrangement of pulleys employed in suspending patients.

M E D I C A L I T E M S.

UNDER THE DIRECTION OF

ALEX. NAPIER, M.D.

On the Structure, Development, and Signification of Tuberclé.—A note on this subject has been presented to the Académie des Sciences, by MM. Kiener and Poulet, giving the results of their researches in man and in inoculated animals. Their conclusions are as follows:—

A. Structure of Tuberclé in Connective Tissue Formations (Serous Membranes, Periosteum, Medulla of Bone, &c.)—The tubercle is sometimes simple, sometimes in groups, sometimes infiltrated, and is of two types, cellular and fibrous.

I. *Cellular Tuberclé*—1. *Simple Form.*—The tubercle, invisible or barely visible to the naked eye, is formed by a spherical or fusiform enlargement of a blood-vessel, more rarely of a lymphatic vessel, and by the aggregation round this enlargement of a certain number of cells. If the vessel is a capillary with a single coat, the vascular enlargement is caused by hypertrophy and hyperplasia of the endothelial cells of a limited portion of the vessel. If it is a capillary, with two or three coats, the enlargement is produced; (1.) by an active proliferation of the endothelial cells, which become arranged after the manner of stratified epithelium; and (2.) by the formation of an embryonic connective tissue at the expense of the external coat of the vessels. 2. *Form in groups.* This tubercle is as large as or larger than a millet seed, and is formed by a complex network of capillary vessels, which have already undergone the changes described above. 3. *Infiltrated form.* The tubercle is composed of a granulation tissue, richly supplied with capillary vessels, most of which have the endothelium in many strata, and some of which are transformed into hyaline cylinders or follicular cords.

II. *Fibrous Tuberclé*.—A series of transition forms are intermediate between the cellular and the fibrous tubercle. As the advance of the tubercle becomes more chronic, fibrous new formation is substituted for embryonic.

B. Structure of Tubercl in the Glandular Organs.—In the glands the interstitial tissue may be affected alone, giving origin to tubercles, the structure of which is analogous to that of the tubercles in connective tissue. But in other cases the glandular elements participate in the formation of the tubercle. Thus, the seminiferous ducts in the testicle, the bronchioles in the lung, filled and distended by the products of epithelial proliferation or of pus, constitute a sort of focus, round which the interstitial tissue, transformed into embryonic tissue, presents the characteristic appearances of vascular change: hyaline capillaries and follicles.

C. Development and Progress of Tubercl.—The tubercular new formation passes through two successive phases:—1. Nodular formation. The nodules, developed most frequently in the course of the tubular channels (vascular and lymphatic vessels, tubes, and excretory ducts of glands), are formed partly by the proliferation of the endothelial or epithelial cells of the tube, partly by the new formation of an embryonic or fibrous connective tissue at the expense of the external coat of the tube. 2. Hypertrophic and degenerative phase. The various anatomical elements of the newly formed embryonic tissue display a tendency to hypertrophy, and to run together so as to form giant cells. This tendency is manifested by preference and always begins, in the epithelial elements of glands and in the endothelial elements of vessels.

It tends to a special hyaline degeneration of the anatomical elements, and ends in obliteration of the vessels. It brings in its course fatty degeneration and irreparable destruction of the tissues.

D. Pathological Signification of the Tubercl.—The nodular alteration of the tubular channels of organs and tissues, as well as the encroaching process of degeneration, differentiate the tubercular process from other inflammations of general or special origin, in the products of which giant cells and vessels attacked with endoarteritis and periarteritis are equally found.
—*La France Médicale.* No. 12. 1880.—G. S. M.

Surface Temperatures.—Dr. B. v. Ansep (*Würzburger Phys. Med. Verhdlg.* xiv, p. 44), carefully noted the temperature of the skin in 50 cases of pulmonary disease, using a specially constructed surface thermometer, the reservoir of which was flat, and shielded from the influence of the surrounding atmosphere by a bell-shaped glass protector. His conclusions are these:—

1. The practice of taking peripheral temperatures is one

of considerable practical importance. The temperatures so obtained are not accidental, but stand in direct relation to certain conditions of the internal organs, particularly the lungs.

2. In health, the temperature of the one side is very seldom exactly the same as that of the other; a slight but inconstant difference is usually observed, sometimes the right side, at other times the left, being the warmer. This difference never amounts to more than $0\text{'}1$ ° to $0\text{'}3$ ° C.

3. The temperature is invariably higher on that side in which inflammatory action is going on, the difference varying from $0\text{'}3$ ° to $1\text{'}5$ ° C.

4. Over pulmonary cavities the temperature is lower than at any other part of the surface of the chest.

5. The temperature is lower over those parts of the lung which are completely hepatised than over those at which the inflammatory process is still in its first stage.—*Centralblatt f. d. Med. Wiss.* No. 24. 1880.

Diagnosis of Tumours of the Mamma.—Dr. Gross, in the *New York Medical Journal* for June, 1880, sums up his conclusions on this subject in the following propositions, these conclusions being based on cases which occurred in his own practice, and those collated from various sources:—

1. A uniformly hard, perfectly movable, nodular, slowly growing tumour, particularly if it be seated at the upper and outer part of the gland of impubic subjects, and of married women toward the twenty-third year, and be free from ulceration, alterations in the skin, veins, nipple, and lymphatic glands, is a solid fibroma, and the diagnosis is strengthened by the presence of several growths in one or both breasts.

2. A hard, lobulated, peripheral tumour, or one which, after having remained stationary or progressed slowly for several years, suddenly and rapidly acquires a large volume, assumes an unequal consistence, being firm at some points and soft or fluctuating at others, occurring toward the thirty-sixth year, unaccompanied by lymphatic involvement, but attended, possibly, with discolouration of the skin, deformity of the nipple, and limited superficial adhesions, and, it may be, with dilatation of the veins, discharge from the nipple, and ulceration and fungous protrusion, is a cystic fibroma.

3. A firm, rapidly growing, peripheral tumour, appearing in prolific married females at about the thirty-seventh year, with, possibly, discolouration and adhesion of the skin, and ulceration, but without deformity of, or discharge from, the

nipple, or enlargement of the glands, is a solid sarcoma. A tumour possessing these attributes, and occurring toward the thirty-second year, is probably a firm spindle-celled sarcoma, while one developing at about the forty-second year is more apt to be a firm round-celled sarcoma.

4. A lobulated tumour, particularly if it involves the greater part of the mamma, of quick growth from the commencement, or progressing rapidly after having increased comparatively slowly for some time, of large size, of varying or unequal consistence, occurring toward the thirty-third year, in prolific married subjects, and attended with discoloration of the skin, ulceration, enlargement of the veins, and, possibly, with discharge from the nipple and limited adhesions, or, it may be, with deformity of the nipple and glandular enlargement, is a cystic sarcoma. A very rapidly progressing tumour of soft, apparently fluctuating consistence, with stretched skin and enlarged veins, appearing in young girls before puberty, and in young married women, is a medullary sarcoma, which may be solid or cystic, and is, as a rule, composed of small spindle cells.

5. A solitary, rapidly and continuously growing, although not very bulky, rather firm, or, possibly, soft tumour, occurring at about the forty-fifth year, with limited discoloration of the skin, but not fixed to the chest, and attended, possibly, with deformity of the nipple, superficial adhesions, ulceration, dilatation of the veins, and enlargement of the axillary glands, is a solid myxoma.

6. Cystic myxoma possesses the same consistence and growing attributes of the former variety, but it develops at about the forty-eighth year, and is liable to be attended with discoloration, adhesion, and ulceration of the skin. The veins, nipple, and glands, however, are normal.

7. A hard, heavy, nodular, solitary, very slowly and equably increasing tumour, especially if it develops in the immediate vicinity of the nipple of a married woman toward the thirty-fifth year, and is accompanied by adhesion and discoloration of the skin, and ulceration, and, possibly, by deformity of the nipple and enlargement of the glands, but is free from fixation to the chest and dilatation of the veins, and is preceded by a discharge from the nipple, is a cystic adenoma. A solid adenoma can not be distinguished from a solid fibroma.

8. A densely hard, inelastic, irregular, solitary, slowly growing tumour, occurring in prolific married females toward the forty-eighth year, inseparably connected with the mamma, accompanied by induration and enlargement of the associated

lymphatic glands, retraction of the nipple, infiltration of, and, possibly, nodules in, the skin, ulceration, and fixation to the chest, and, it may be, by a discharge from the nipple, is a scirrhous carcinoma; and the diagnosis is strengthened if there be a history of heredity, if the tumour was preceded by psoriasis or eczema of the nipple, or if it developed from an induration left by puerperal mastitis.

9. A soft, lobulated, voluminous, solitary, and rapidly increasing tumour, occurring in the same class of women, at about the fiftieth year, and attended with infection of the glands and skin, retraction of the nipple, fixation to the chest, and, possibly, extension to the opposite breast, but without discharge from the nipple, or marked tendency to prominence of the veins or ulceration, is a medullary or encephaloid carcinoma.

10. A hard, very slowly growing, small, solitary tumour, occurring toward the forty-fifth year, with adhesion to the skin, and, it may be, nodules in that structure, prominence of the veins, retraction of the nipple, and enlargement of the glands, and, possibly, with invasion of the opposite breast, fixation to the chest, ulceration, and discharge from the nipple, is a colloid carcinoma.

11. A densely hard, irregular and knotty, contracting and small, solitary tumour, occurring at about the forty-seventh year, and attended with retraction of the nipple, infection of the glands and skin, and, possibly, distinct tubers in the latter structure, ulceration, and immobility on the chest, is an atrophying scirrhus.

12. A slowly increasing, solitary, nodular, or slightly lobulated tumour, occurring after the menopause, covered by thinned and discoloured skin, fluctuating, and probably discharging by the nipple, but without enlargement of the veins or glands, and without fixation to the chest, is an involution cyst.

13. A solitary, smooth, firm, and elastic, or, possibly, fluctuating tumour, occurring in the vicinity of the nipple of young and prolific married women, of moderate volume, of slow growth, and unattended with alterations in the veins, nipple, skin, or glands, or with adhesions, but liable to ulceration and enlargement of the glands if it inflames, is an evolution cyst.

14. A solitary, slowly growing, not bulky, fluctuating, or semi-solid tumour occurring near the nipple of lactating women, and unattended with changes in the coverings of the mamma or in the glands, is a lacteal cyst.

15. A slowly growing, small, smooth, round, firm, and elastic or fluctuating, solitary tumour, occurring between the ages of twenty and thirty years, seated at the upper and outer border of the breast, and not near the mammilla, with a disposition to ulcerate, but without other changes in the skin, veins, or glands, is a hydatid cyst.

Physiological and Therapeutical Action of the Salts of Pelletierine.—The following are the conclusions arrived at by Dr. Dujardin-Beaumetz, and announced in a paper read before the Académie de Médecine, with regard to the action of these salts.

1. The alkaloids of the pomegranate, particularly the sulphates of pelletierine and of isopelletierine, have a real and energetic physiological action on the system.

2. They paralyse the motor nerves, but leave intact muscular contractility. They do not affect sensibility, and appear to attack the motor nerves at their muscular terminations. They are "curarising" poisons.

3. The sulphates of pelletierine and of isopelletierine are very active taenicides. Given in doses of 30 centigrammes, in a solution containing 50 centigrammes of tannin, they effected the expulsion of the whole tapeworm, including its head, in 56 out of 58 cases.

Dr. D. suggests also that these salts should be tried in those affections in which curare is indicated (tetanus, hydrophobia), in ocular affections in which it is desirable to excite active congestion of the fundus of the eye, and in certain varieties of vertigo, particularly that associated with Ménière's disease.—*Bull. Gén. de Thér.ap.* 30th May, 1880.

Treatment of Convulsions in Infants.—To prevent convulsions in nervous children, M. Simon recommends careful exclusion of excitement, and attention to the digestive organs. At the same time he gives bromide of potassium.

R.	Orange Flower Water,	120 grammes.
	Bromide of Potassium,	2 grammes.
	Aqua Laurocerasi,	15 grammes.
	Ether,	2 or 3 drops. m

Of this mixture he gives the fourth part daily, suspending its administration after four or five days. The attack itself follows generally on indigestion. He then prescribes as a purgative enema—

R.	Sulphate of Soda,	10 grammes.
	Senna Leaves,	8 grammes.
	Water,	150 grammes.
	Honey of Mercurialis Perennis,	30 grammes. m

After that he gives an emetic, if the convulsion is already past, and then a few whiffs of ether. The doctor's duty is not yet over; there are yet three remedies to be tried. He prescribes first an enema, given after the bowels have been opened—

R.	Water,	100 grammes.
	Musk, . . . .	.10 or .15 centigr.
	Chloral, . . . .	.50 centigr.
	Yolk of Egg,	½. m

Then a mixture as follows—

R.	Bromide of Potassium,	1.50 centigr.
	Lime or Orange Flower Water,	120 grammes.
	Aqua Laurocerasi,	15 grammes.
	Ether,	2 or 3 drops.
	Syrup of Codeia,	5 grammes.
	Simple Syrup,	30 grammes. m

Sig. A coffeeespoonful every hour.

If the convulsions last till the second day, he prescribes mustard baths, repeated every three or four hours. After some hours, if urine has been passed, the attack is at an end; if not, the treatment must be continued, for the attack may recommence. A great deal of urine is passed at the end of a nervous attack.

If it is not all ended put a blister on the nape of the neck, for no longer than three hours. Envelop the lower limbs in cotton wool, and cover them with a large stocking.—*La France Médicale*. No. 20. 1880.—G. S. M.

Treatment of Intra-Uterine Hydrocephalic Head.—Dr. Halliday Croom gives the details of a labour where rupture of the uterus and death took place during an attempt to deliver with the forceps in such a case. He points out the great probability that puncture of the head instead of the use of the forceps would have saved the mother, and lays it down as a rule, that where the foetus is hydrocephalic the forceps is dangerous.—*Obstet. Journal*. March, 1880.—W. L. R.

Duboisia in Ophthalmic Practice.—Dr. S. D. Risley, in a paper on the relative value of the sulphates of atropia

and *duboisia* in ophthalmic practice, thus formulates his conclusions :—

1. In solutions not stronger than two grains to the ounce, *duboisia sulphate* is free from danger.
2. The two-grain solution of *duboisia sulphate* more rapidly paralyses the ciliary muscle than a four-grain solution of *atropia sulphate*.
3. The duration of its effect is less than half that of *atropia sulphate*.
4. The preparations now in the market are more liable to irritate the conjunctiva than neutral solutions of the sulphate of *atropia*.
5. In the treatment of inflammations of the eye, *duboisia* is quite as useful as *atropia*, and may therefore be used as a substitute.—*American Journal of the Med. Sci.* April, 1880.

Surgical Analgesia.—This is the name proposed by M. Bossis, for the condition of insensibility to pain, produced by injecting 15 milligrammes of *morpbia* under the skin, and causing the patient, 20 minutes afterwards, to inhale a small quantity of chloroform. M. Bossis (*Thèse de Paris*, dated 28th May, 1879), thus sums up his observations :—

1. By the combined action of chloroform and *morpbia*, there is obtained a condition of complete insensibility to pain, while the intellectual faculties, tactile sensibility, hearing, sight, and the power of performing voluntary movements, are all preserved unaffected, to a great extent.
2. This surgical analgesia differs from the demi-anæsthesia produced by chloroform or ether alone, in not being preceded or accompanied by any period of hyperæsthesia—a period usually marked by violent agitation, and an exaggerated tendency to reflex arrest of the heart's action.
3. This proceeding has the great advantage of not being attended by the dangers involved in complete anæsthesia.
4. The production of this form of analgesia has so far proved extremely harmless; nevertheless, it is acknowledged that further and extensive research is needed before the subject can be considered definitely settled.—*Bull. Gén. de Thérap.* 30th May, 1880.

Revision of the U.S. Pharmacopœia.—At the Sixth Decennial Convention for the Revision of the United States Pharmacopœia, which met recently at Washington, several important and radical changes were adopted. The following are the principal of these.

All measures of capacity are to be abandoned, and quantities are to be expressed in parts by weight.

All articles are to be arranged in a continuous alphabetical order, such headings as extracta, decocta, however, being retained, when general directions are given referring to the whole class of such preparations.

All tinctures, wines, &c., in which a slight variation of dose is of no importance, are to be made as nearly as possible of a uniform percentage strength; but in the case of such highly active preparations as the tinctures of nux vomica, aconite, opium, &c., the present strength is to be retained as far as possible.

Quantities or parts by weight of ingredients entering into a composition, are to be expressed, whenever possible, in a centesimal ratio.

All doses are to be omitted.

The different headings will be accompanied by synonyms.

Temperature will be noted both in degrees Centigrade, and in degrees of Fahrenheit's scale.

A uniform method for taking specific gravities will be prescribed.

The exact weight of finished products is to be given when partial loss of any of the ingredients occurs during preparation.

Numerous tables are to be appended; a table of solubilities of the officinal chemicals in water and in alcohol, at 60° F., and at their boiling points; an alcoholometrical table; acidimetrical tables (tables of the sp. gr. of acids); a list of reagents for qualitative, quantitative, and volumetric use; a weight and volume table (to facilitate prescribing in the decimal system), showing the relationship between the weight and measure of a given volume of any liquid preparation; a table of sp. gr. of officinal liquids; a table comparing the strength of powerful Galenical preparations in foreign and in the U.S. Ph.; a table of thermometric equivalents; an index, containing all synonyms, with accent marks to indicate pronunciation; a table of saturations.—*New Remedies.* June, 1880.

Treatment of Abortion.—Dr. J. F. Horne recommends the use of hot water injections into the uterus to cause contraction of that organ after abortion. He uses two pints of water as hot as can be borne by the hand, employing an ordinary Higginson's syringe with vaginal tube. It is found to be much more efficacious than ergot in causing expulsion of the placenta and cessation of the haemorrhage. Three successful cases are related.—*Obstet. Journal.* March, 1880.—W. L. R.

A Successful Case of Gastro-tomy in Extra-Uterine Pregnancy.—Mr. Lawson Tait gives the details of a second operation of this kind. He had no idea until sixteen days after the operation that it was a case of extra-uterine pregnancy with which he was dealing, the abdomen having been opened under the belief that the patient was suffering from haematocele. But when foetal bones began to be discharged from the wound the diagnosis became clear. When gastro-tomy was performed, only clots of blood were removed, and under the impression that the haemorrhage had come from a malignant growth, the wound was closed. It did not heal, however, till the decomposing foetus and placenta had been all discharged, which was accomplished in about a month after the operation.—*Obstet. Journal.* April, 1880.—W. L. R.

The Treatment of Alopecia. M. Alfred Fournier indicates the two following methods:—

1. Shaving twice a week, not only the bald patches, but also over a zone of from one to three centimetres round these. Shaving is certain to excite the vitality of the pilous system.

2. Stimulant frictions, the stimulating agent being of little importance. M. Lailler recommends the following formulæ.

R. Balsam of Fioravanti.
Spt. of Camphor.
Tinct. of Pyrethrum, à à 100 grammes.
Liquor of Ammonia, 6 grammes. m

Sig. To be rubbed in for a few minutes morning and evening.

R. Tinct. Pyrethri.
Tinct. Pimento, à à 100 grammes.
Spt. Camphoræ, . 50 grammes.
Liq. Ammoniæ, 5 to 6 grammes.

3. If these methods are insufficient, then have recourse to M. Vidal's treatment, the repeated application of blisters over and a little beyond the bald spots. Apply the blisters every five or six days, and look for a cure in three or four months.

4. Hydrotherapia, constitutional remedies, iron, gentian, may be employed in some cases with success.

Recently the employment of subcutaneous injections of pilocarpine has been found to be followed by cure of baldness.—*La France Médicale.* No. 12. 1880.—G. S. M.

A Simple Apparatus for the Treatment of Fractures of the Clavicle.—Dr. L. A. Dugas, in the *N. O. Med. and Surg. Journal* for January, describes his method of treating

fractures of the clavicle. He discards all axillary pads as inefficient and injurious. To meet the usual indications in this fracture, he prepares and applies an apparatus as follows: A square yard of unbleached shirting is cut diagonally, so as to form two triangular pieces. To each of the acute angles of one of these pieces, a 3-inch bandage, 4 yards long, is sewed. This completes the apparatus. The displacement is then reduced by carrying the shoulder upward, backward, and outward. Then the middle of the long side of the triangle is applied beneath the elbow, leaving a margin of 4 inches behind, the right angle being directed toward the fingers. One of the acute angles, with its bandage, is now carried between the arm and chest, up to the fractured clavicle, around the back of the neck, over the sound shoulder in front and beneath the axilla, and, finally, around the arm just above the elbow. The other end of the strip is then carried up, in front of the forearm, to the sound shoulder, behind and beneath the axilla, and around the chest and arm, so as to meet its fellow to be tied to it. Finally, the margin left projecting behind the elbow should be elevated, doubled, and stitched, so as to prevent the elbow from sliding out. The strips encircling the arm should also be stitched to prevent displacement.

This bandage is said to be a very comfortable one, easily applied, and efficient.—*Canada Lancet*.—W. G. D.

Incontinence of Urine in Children.—Dr. R. W. Parker recommends belladonna for this disease where it cannot be traced to any organic cause. He thinks that the doses usually given are of little or no use, and that, if necessary, they should be raised to 30 minims of the tincture three or four times a day. He is of the opinion that punishing the child is worse than useless.—*Obstet. Journal*. April, 1880.—W. L. R.

Eczema due to Administration of Chloral.—At a recent meeting of the *Société de Médecine Pratique*, M. Brochin, in speaking of the inconveniences of chloral, related the case of a young, strumous girl, subject to eczema of the lips, who, on two separate occasions, found this affection to reappear immediately on taking a draught and an injection of chloral, and that with such intensity that the mouth and the tongue became involved. The diagnosis of buccal eczema was confirmed by M. Bazin. In the discussion which followed his remarks, others stated that they had frequently observed an erysipelatous looking eruption on the face, of a painless

character, following on the exhibition of chloral in large doses, and disappearing when the remedy was discontinued.—*La France Médicale.* No. 10. 1880.—G. S. M.

Boracic Acid in Inflammations of Mucous Membranes.—Dr. J. Skelton Hill reports a case of gonorrhœa in which he employed boracic acid injections (half a drachm to four ounces); in four days from the commencement the patient was perfectly well. In another case, the disease, which had lasted six days, was cured in one week; in this instance the injection was increased in strength to ten grains to the ounce. The patient, who was a letter-carrier, continued his employment during the treatment. Dr. Hill has also used this agent as an inhalation in follicular tonsillitis and post-nasal catarrh, with most satisfactory results. The most striking benefit was obtained in a severe case of cystitis, due to long standing resilient stricture, by injection of an eight-grain solution morning and evening, after drawing off the urine. Before beginning this treatment the patient had often to get up as often as thirteen times in a night to pass urine; on the first night after injection this was reduced to seven times, next night to four times, and next night two times. The urine, which at first was so thick and tenacious that it adhered to the side of the vessel when inverted, became clear, and threw down no sediment. The injections were made through a No. 2 flexible catheter.—*Med. and Surg. Reporter.* 15th May, 1880.

A Rapid Method of Analysing Milk.—Mix together, in a burette, ten cubic centimetres of alcohol (strength 75 degrees), ten cubic centimetres of milk, to which has been added one drop of caustic soda, and ten cubic centimetres of pure ether. After agitation, the mixture is allowed to stand, when it soon separates into two layers. The lower of these should be carefully drawn off; it contains the caseine, sugar of milk, and salts, which may be separated and estimated in the usual way. The upper layer contains only the butter, to ascertain the weight of which, it is necessary merely to evaporate.—*Bull. Gén. de Théráp.* 30th May, 1880.

Intra-Uterine Menstrual Coagula.—Dr. M. Duncan argues that such do exist, and gives a case in proof. He also considers the question "Can the otherwise healthy virgin uterus, or the impregnated uterus at a remote period from childbirth or abortion, be dilated by a menstrual clot beyond

its ordinary dimensions when replete?" He thinks it may; not as the result of stenosis or flexion, but from hæmorrhage into its cavity. As an argument in favour of such an occurrence, he gives a case where dilatation of the cavity existed without the enclosure and retention of a clot.—*Obstet. Journal.* March, 1880.—W. L. R.

Books, Pamphlets, &c., Received.

- L'Année Médicale (Deuxième Année), 1879. Résumé des progrès réalisés dans les Sciences Médicales, publié sur la direction du Dr. Bourneville. Paris : E. Plon & Cie. 1880.
- Tables of the Physiological Action of Drugs. By E. A. Morshead, M.R.C.S. London : H. K. Lewis. 1880.
- A Guide to the Examination of the Urine, designed chiefly for the use of Clinical Clerks and Students. By J. Wickham Legg, F.R.C.P.L. Fifth Edition. London : H. K. Lewis. 1880.
- Metric Record of Prescription and of Medical Observation. London : H. K. Lewis. 1880.
- On the Bile, Jaundice, and Bilious Diseases. By J. Wickham Legg, F.R.C.P.L. London : H. K. Lewis. 1880.
- Royat (les Bains) in Auvergne: its Mineral Waters and Climate. By G. H. Brandt, M.D. London : H. K. Lewis. 1880.
- Food and Feeding. By Sir Henry Thompson, F.R.C.S., &c. Reprinted from the "Nineteenth Century," with considerable Additions. London : Fred. Warne & Co.
- On Deafness, Giddiness, and Noises in the Head. By Edward Woakes, M.D., London. Second Edition, Revised and Enlarged, with Illustrations. London : H. K. Lewis.
- A Manual of Diseases of the Throat and Nose, including the Pharynx, Larynx, Trachea, (Esophagus, Nasal Cavities, and Neck. By Morell Mackenzie, M.D., London. Vol. i, Diseases of the Pharynx, Larynx, and Trachea. London : J. & A. Churchill. 1880.

THE
GLASGOW MEDICAL JOURNAL.

No. VIII. AUGUST, 1880.

ORIGINAL ARTICLES.

ON INFLUENZA: ITS SYMPTOMS, VARIETIES, AND CAUSES, FOUNDED ON SIX YEARS' EXPERIENCE OF THE DISEASE.

By FRANCIS HENDERSON, M.D., HELENSBURGH.

(Continued from page 461, Vol. XIII.)

II. GENERAL OBSERVATIONS UPON THE CHARACTERS OF THE INFLUENZA, WITH REMARKS ON CERTAIN OF THE MORE PECULIAR SYMPTOMS, AND ON THE NATURE OF THE VIRUS.

DURING the last six years at least, the complaint has not been absent from this locality, although it has doubtless been more prevalent and more aggravated in the months of winter and spring. In consequence of its long prevalence (probably due to certain local causes, which will be considered under the next division), the influenza may be fairly called *endemic*.

Its connection with weather has been very manifest. The conjunction of cold and dampness, with changeableness, forms the worst combination. Whether these weather states and changes act in promoting the spread of influenza, by stimulating the activity of the *materies morbi*, or by disturbing the balance of the system, and so rendering it more liable to be attacked, may be a question. The former hypothesis seems to me the most probable.

Further observation confirms the opinion stated in my
No. 8.

former article, that the complaint which has been here prevalent, is certainly although not highly, *infectious*. A similar statement is made by most of the authorities regarding epidemic influenza.

Besides attacking the members of a family simultaneously, from the general presence of the poison in the atmosphere, the complaint is sometimes observed to spread through a household by the quality of infectiousness. Occasionally, also, there has been reason to suspect that the infection clings to the house itself, an observation which has been made in the case of the poison of diphtheria. Although, as a means by which the disease is spread through a community, infection occupies a very subordinate place, yet the fact is highly important, as bearing upon the nature of the influenza virus.

Abundant experience proves that one attack of the complaint does not protect against another. On the contrary, prolonged observation tends to the opinion that one attack seems to leave the individual more prone to be again attacked; but each successive seizure is likely to be less severe, and of shorter duration, and in time a state of *protectedness* seems to be attainable. This tendency to recurrence of the illness (which must be distinguished from mere relapses), is illustrated in Cases XI and XII, and it is a feature which has been also recognised in the epidemic form of the disease. Thus, we read in the *Annals of Influenza*—"The having undergone an attack of the previous epidemic (in 1834) afforded no protection" against the following epidemic in 1836-37. And, again, some observers were led to believe "that the influenza of 1834 had rather left a susceptibility to, than protected the constitution from, the attack of the late epidemic."*

Another character of the influenza was its tendency to attack the debilitated, particularly those suffering from nervous exhaustion, and to cling most tenaciously to those who were possessed of a susceptible nervous system. Women after childbirth were liable to fall under its influence, and made tedious recoveries.

In these various respects, with the exception of the prolonged prevalence, the character of the illness which has been present in this locality agrees with that of epidemic influenza. The question may be raised, and it has already been suggested by Dr. Parkes †—Are epidemic and endemic influenza two

* *Annals of Influenza*, p. 311. Sydenham Society.

† Reynold's *System of Medicine*. Third edition. Vol. i, p. 30.

forms of the same disease, or are they two distinct diseases ? Without attempting a discussion of this question at present, as this would not only entail a long digression, but would involve considerations which are largely theoretical, and even hypothetical, we would simply express the opinion that epidemic and endemic influenza are two forms of the same disease. This opinion is based upon careful study of the essential symptoms and of the character and course of the complaint, and also upon a comparison of the records of the great epidemics. No doubt some of the illustrative cases given in the preceding portions of this article exhibit peculiar features. But, it must be particularly noted, first, that these cases occurred *among* very numerous cases of ordinary influenza, and that they were manifestly the offspring of the same causes ; and, second, that the principal respects in which the narrated cases were peculiar are just those one would expect to result from the complaint being *endemic*. Protractedness, liability to relapse, and tendency to return are the natural results of the continued presence and effectiveness of the poison. A fresh supply of the poison constantly given off into the atmosphere from its local sources of origin was no doubt the cause of the prolonged prevalence of the complaint, and of the protracted course of some of the cases. The patient constantly inhaling fresh doses of the poison resembled the sufferer from ague in a malarious swamp. In these prolonged cases, moreover, the element of time was afforded for the character of the poison to be more fully developed. To this, we believe, may be fairly attributed some of the peculiar symptoms of the *endemic* form. In typical epidemic influenza the opposite conditions prevail ; the poisonous influence is transient ; after six weeks, on the average, it passes from the locality. Further, the intensity and activity of the poison is apparently heightened, the disease is sharper and shorter, and there is thus less opportunity of recognising the features of the disturbing agent.

Assuming, then, that epidemic and endemic influenza are two forms of the same disease, and are therefore caused by the same poison (acting under different conditions or circumstances), it will be conceded that the endemic form affords special advantages for investigating the nature of the specific virus.

Remarks on Certain of the More Peculiar Symptoms.—In reviewing and illustrating some of the more striking and peculiar symptoms, it is proposed to point out, as we proceed, the resemblance which exists between certain of these

symptoms, and symptoms which display themselves in the course of other complaints. In so far as likeness is based on relationship, its recognition must tend to throw light upon the nature of the poison. General depression of the nervous system was the characteristic symptom of the influenza, as here observed. Cases I and II supply examples of this in its sudden and severe form. In both of these cases, probably in consequence of the powerful feverish reaction which was excited, the poison was expelled from the system, and its depressing effects were quickly and permanently overcome. In cases VI and VII the depression of the nervous system was continued over many months, although during this time it varied greatly in degree, undergoing aggravations and diminutions.

In some instances this depression showed itself only to the extent of producing an unaccountable lassitude not accompanied or followed either by febrile or catarrhal symptoms sufficient to attract the attention of the patient. Such cases were not easily diagnosed, particularly if the patient had not been under observation all through his illness, or was the subject of some chronic disease. The case might be still more puzzling and suspiciously serious, if the nerves of the heart were specially affected by the depressing influence. There might, then, be most irregular and weak action of that organ (not the violent palpitation of the hysterical patient), and even a mitral systolic bruit might be discoverable. On careful inquiry at such a patient, it would generally be found that other symptoms were present, or had been present, which he might not have thought worth relating, such as occasional cold creeps down the back, or some part of the skin. A cold band down the spine was not unfrequently described, sometimes alternating with more or less heat or roasting at some part of the skin. A very common and striking symptom was burning in the palms of the hands, and less frequently in the soles of the feet. At times waves of heat and perspiration passed over the body, bringing on a sense of weakness and even faintness. These slight symptoms were just the representatives of the severe rigors and tremendous glows of heat which were observed in an aggravated case. The burning palms were met with in cases of very varying degrees of intensity. A remarkable fact about this symptom deserves notice—viz., that the *feeling* of burning was far greater than the *real increase* of temperature. This observation was found to be true also of the burning, roasting feeling which was often complained of over the whole surface of the skin. The ther-

mometer showed a rise of temperature, but not at all in proportion to the *complaint* of heat.

The intermittent character of the nervous depression was sometimes very striking. During this spring I attended a woman, aged 54, who had suffered for three or four months from severe influenza, the pyrexial and catarrhal symptoms being both very decided. At the period of her illness I allude to, these symptoms had nearly passed over, but the patient was still in bed from nervous exhaustion. Every alternate day great aggravation of the depression occurred which affected both mind and body. The patient felt as if sinking through the bed, and at some of these times the heart was most irregular and disturbed in its action, so much so that there seemed grounds for considerable anxiety. On the intermediate days she was comparatively comfortable, and repeated examination on these occasions failed to discover any signs of organic disease of the heart. The periodicity of the increased depressions gradually became less marked—the coldness in the back and glows of heat (which, in this patient, outlived for a long time the more decided pyrexial symptoms) grew less frequent and decided, and after six weeks more the patient was able to leave home. She was then, however, weak in body and much depressed in mind.

The Peculiar Cardiac Symptoms.—We shall ask attention shortly to the peculiar cardiac signs and symptoms which were observed in the course of the influenza. These were pretty fully described in the pages of this *Journal* for November, 1877. They occurred chiefly in the more advanced stages of the protracted cases, or as *sequelæ*. But this was not invariably the case. Weakness of the heart's action, intermission of the pulse, and even syncope, were sometimes observed in cases which were not prolonged, and which were not in other respects severe. For example, on the 15th of September, 1879, a gentleman, aged about 50, and usually in very vigorous health, had some slight rigors followed by feverishness. At the same time he had copious diarrhoea—brown watery discharges (the attack resembled those described in the group of cases—number VIII). This patient remained indoors, but did not feel ill enough to stay in bed. The symptoms gradually abated until the 24th, when he suddenly got pale; perspiration burst out over his face, and for a minute or two he was quite faint. This recurred for several days about the same hour. Every forenoon, for some hours before the faintness, he was depressed and uneasy, and in the afternoon and evening felt perfectly well. Careful examination discovered

no weakness or imperfection about the heart. For some days longer this gentleman felt low and weak in the forearms without the faintness coming on; but, in the course of another week, he had quite recovered his usual vigour. Such a case as this recalls the well known effects upon some individuals of the inhalation of air from a newly opened drain or cesspool, while the resemblance to the depressing effects upon the heart of the poison of diphtheria, cannot fail also to suggest itself.

The signs of cardiac weakness which exhibited themselves in the later stages of the severe form of the complaint varied much in degree—occasional intermissions—disturbance of rhythm—weak first sound and accentuated second sound—mitral systolic murmur and cardiac dropsy. Patients suffering thus frequently complained of precordial uneasiness, sense of sinking, and breathlessness on slight exertion.

These signs and symptoms were no doubt, in the first instance, due to the paralysing influence of the poison on the nerve centres. In the more aggravated and protracted cases this loss of nerve force seemed to engender a debility of the muscular substance of the heart, permitting of a yielding of the walls and consequent dilatation. When such a condition is present to a certain degree, a *mechanical* murmur is the natural result.

A striking feature in these cases was the *absence* of anaemia, which is attributable to the remarkable circumstance to which attention has already been drawn—viz., that during the whole course of these tedious illnesses, with the exception of the first few weeks, the functions of digestion and assimilation of food were performed surprisingly well, and in consequence, by the end of the second or third month, when the heart disorder was most liable to appear, the general nutrition was usually good, and there were no indications of poverty of blood. A systolic murmur, if such were present, was not, therefore, due to the state of the blood; it was not *haemic*, but *mechanical*. Now, if it is established that from loss of muscular tone alone mechanical murmurs may arise, the question may be asked—are so-called anaemic murmurs not also mechanical. In marked cases of anaemia there is probably as great a loss of tone in the muscular substance of the heart as in the cases above described. What, then, is the necessity, it may be asked, of seeking for a second cause of the murmur in the condition of the blood itself?

The more extreme signs of cardiac debility in these protracted cases of influenza—viz., systolic murmur and dropsy, did not present themselves in many cases, and in these they

did not last many weeks, but the feeble first sound continued in many cases for months, and the weakened innervation of the heart, evidenced by such signs as an occasional omission of a beat, disordered rhythm, feelings of *heart sinkings*, and palpitation, showed itself at intervals from slight disturbing causes, in some cases for two or three years afterwards. Whether the heart in all cases completely recovered its natural vigour after a severe and protracted attack of this peculiar debility, is a question which I am not yet in a position to answer.

Although the poison of influenza exerts a depressing influence upon the *whole* nervous system, there are certain parts liable to be affected to a greater degree. We have just seen that the cardiac nerve centres are particularly prone to suffer, and many of the other peculiar and striking symptoms of the complaint have their origin in this unequal action of the specific virus. Thus, in some cases, there was urgent dyspnœa from an affection of the respiratory nerves associated with catarrh of the bronchial mucous membrane. This, however, was not a common phase observed in this locality, although in many recorded epidemics it has been the prevailing form of the complaint. "The poison which produced influenza," says Dr. Graves, describing the epidemic of 1837, "acted on the nervous system in general, and on the pulmonary nerves in particular." *

Various other neuroses occurred so frequently in the course of the complaint, and displayed so often the same peculiarities, that they deserve some attention. Features common to all these were—First, a tendency to put on the intermittent type; Second, it could generally be observed that their return was associated with returns or aggravations of the general symptoms of the complaint.

Neuralgia was very common, and occurred in all situations. Sometimes the nerves of the face and of the upper and lower extremities *on one side* were simultaneously affected. Still more frequently neuralgia spread from the root of the neck upwards in the course of the occipital nerves, or from the lower cervical vertebrae down both upper extremities, often not extending below the elbow. At other times it had its seat in the lower part of the back, from which it spread down both lower extremities. But the most characteristic feature of the neuralgia of influenza was its apparently close association with the affection of the mucous membrane. It has already been stated that patients very often complained of a

* *Annals of Influenza.* Page 347.

very painful sore-throat, which, on examination, exhibited only some tumefaction and redness of the mucous membrane, while in a few hours after, the throat appearances being the same, the pain might be gone.* A similar observation was made, when the mucous membrane covering the gums was implicated, as in Case V. Also in cases in which there was reason to believe that the gastric mucous membrane was the seat of the specific catarrhal affection; the patient frequently suffered from neuralgia in the region of the stomach.

Hyperæsthesia.—Portions of the skin, chiefly about the face and head, occasionally exhibited extreme sensitiveness to the slightest current of air or fall of temperature. Some patients described this sensation to be as if the integument of the part were replaced by perforated card, through which the air painfully affected the nerves. While this state continued protection and warmth were absolutely necessary. If these means were neglected all the patient's symptoms were liable to be aggravated, and an attack of acute neuralgia in the part was a common penalty. At other times there was extreme sensitiveness to touch. For example, an elderly lady had been confined to bed for five or six weeks with the ordinary influenza symptoms, which were gradually abating, when one night, simultaneously with (and I believe in consequence of) a sudden fall of temperature, accompanied by high wind, she felt worse. Her throat, which in the earlier part of her illness had exhibited the peculiar catarrhal affection, became swelled and painful *on the right side only*. She suffered from shooting neuralgic pains over the same side of the head and cheek. The pain also extended down the neck and right arm, and down the right side of the trunk into the lower extremity. The integument covering these parts, particularly the cheek, neck, right side of the chest, and abdomen, was highly hyperæsthetic. The patient described these regions as if covered with a "network of stings." She was conscious that the pain was quite on the surface, and complained of the *slightest* touch. Dr. Parkes† mentions among the symptoms of epidemic influenza "most decided hyperæsthesia of the skin of the neck and head."

Spasm.—In Case XII, we have an illustration of the abdominal muscles becoming affected with tonic spasm, which

* Regarding the epidemic of 1803 an observer writes—"Many complained of great soreness in the throat; when, upon inspecting the fauces, no morbid appearance could be perceived."—*Annals of Influenza.* Page 210.

† Reynold's *System of Medicine.* Third Edition, page 42.

lasted some weeks. Several such cases came under observation.

Disturbance of the Nerves that convey Sensation of Temperature.—This took different forms. For example, a middle aged woman suffered for very many months from protracted influenza. With the exception of six weeks spent in bed, she managed to keep at her employment, although very unfit. This patient had severe neuralgia in the course of the occipital nerves, which came and went for many weeks. Thereafter she complained of a feeling of intense *coldness* in the occiput and up to the crown of the head, but to her own hand, as well as to mine, the part had a natural heat. This perverted sensation intermitted, but continued at intervals for many months. Again, an elderly lady had a typical attack of the prevalent influenza. At the beginning of her illness she had severe fits of paroxysmal cough, worst during the night and early morning. There were also loud bronchial sounds audible in the right axillary and lateral regions of the chest (the corresponding part of the lung had been the seat of congestion or inflammatory mischief some years previously). For the removal of the bronchial affection a good many mustard and linseed poultices were applied, and in the course of about ten days the abnormal sounds had completely disappeared. More than a week after the last application, the patient began to complain greatly of a hot roasting feeling in the skin of the part where the poultices had been applied. Any movement of the body or arm, which caused the slightest stretching of the skin, was very painful. On examining, the skin presented the natural appearance, and its temperature was normal (neither herpes zoster, nor any other cutaneous eruption, subsequently made its appearance). This lady suffered in this way, in a variable degree, for several weeks, and for some time after that, exposure of the surface of the body to cold, as in undressing, brought on the hot feeling in the part. While this peculiar neurosis was present in her right side, the patient also complained of weakness (which amounted to slight loss of motor power) in the right leg, and of numbness of the second and third toe, extending up the foot. All these symptoms gradually wore away. Illustrations of this kind could be easily multiplied did space permit. Great coldness, as if an ice bag had been applied, was often complained of on the back of the neck extending across the shoulders. At one time coldness, and at another roasting of the skin over the epigastrium, was described. This occurred after the more decided symptoms of catarrh within the stomach itself had abated. These feelings were

really disordered sensations, neither coldness nor heat being perceptible to the touch.

Disturbance of the Vaso-Motor Nerves.—Under this heading I would ask attention to a class of very interesting phenomena which frequently presented themselves. They are, no doubt, examples of vaso-motor derangement, but the interest they excite is of a much wider character, having probably a bearing upon the subject of the *fever process*. In many cases the chills, heats, and perspirations were confined to one part of the body. This peculiarity was most common in the upper half of the body. After some cold creeping in the upper part of the back, extending over the face and arms, these parts would get into a glow of heat, particularly the face and the palms of the hands. The glows of heat (which lasted from two or three minutes to nearly an hour), usually passed off with perspiration, likewise confined to these parts.

In other cases these symptoms were present in the lower half of the body *only*. For example, an elderly man, otherwise in sound health, had an attack of influenza which confined him to bed for six weeks. During the latter half of that time, the cold shivery feelings (which came on irregularly every two or three days), were experienced in the lower extremities and lower half of the trunk *only*. The subsequent burning heat and perspiration being also limited to these parts. This patient considered the upper half of his body quite well.

No doubt, in this and in similar cases, there was some depression of the *whole* nervous system, but only certain portions of it were affected to such a degree as to have set up in them the symptoms of what may be called paroxysmal fever. These symptoms were sometimes even more localised. For example, a married lady, aged about 30, gave birth to her second child in the autumn of 1878. During her convalescence she was attacked by influenza, which hung about her for many weeks. By confinement to bed, and the use of quinine, she slowly got rid of all her symptoms, except the return at irregular intervals of cold shivery feelings, heat and perspirations *in one part*—viz., in the right iliac region and upper part of thigh, extending round to the back. There was a history of an old inflammatory attack in the right iliac region. This case, and others of a similar character, seem to teach that the poison of influenza fastens most easily, or at least takes firmest hold, on previously damaged portions of the nervous system.

It is of interest to note that a case of *local influenza*, as the above might be called, is not a novel observation. In a foot

note in the work of Sir Henry Holland, already quoted, I was interested to find the following case.

"Dr. Leonhard, of Muhlheim, relates a singular case of a woman in whom an attack of influenza (the severe epidemic of February and March, 1837), passed into a local quotidian intermittent, affecting first the left, afterwards the right arm, with every successive symptom of regular ague; the rigor, heat, and stage of perspiration all distinctly marked in each fit—other parts of the body wholly unaffected—the disorder cured by quinine."

The phenomenon of real coldness, caused by contraction of the blood-vessels in a limited area, followed by abnormal heat confined to the same part, is of the nature of reflex action taking place through the nerve centres which control the heat supply and expenditure of the part. We cannot pursue this subject further at present, but would merely remark that the existence of such a condition as *a local fever* cannot fail to have an important bearing upon the theory of fever in general.

Passing now from the consideration of the more direct effects of the poison of influenza on the nervous system, we shall shortly refer to the character of the pyrexia, and to the appearances, symptoms, and characters of the affection of the mucous membrane, chiefly for the purpose of exhibiting the relationship of influenza to other complaints, and in this way elucidating the nature of the poison.

In the large majority of cases, in which the affection of the mucous membrane could be examined, redness and tumefaction were the uniform appearances. This condition tended to spread by continuity of surface. It also, as we have seen, exhibited the phenomenon of *metastasis*, showing that it was a secondary manifestation of a general disease. The accompanying fever was strikingly adynamic, tending to fluctuate much in degree; its aggravations, if decided, liable to be ushered in, like the original onset, by rigors. The complaint at times displayed undoubted infectiousness, at other times this was not certain.

Substituting skin for mucous membrane, this description might well apply to erysipelas. The connection between these two complaints made itself manifest, during recent observation, by the actual development of erysipelas on the face in several patients who were suffering from influenza, and had been under this latter complaint for two or three weeks. Turning now to the records of influenza, for further evidence of this relationship, we find one observer of the epidemic in 1803 describing the complaint as "partaking

much of an erysipelatous nature, the fever attending being much of that kind, and local attacks of erysipelas occurring exteriorly on many parts of the body, when the lungs were quickly relieved.”*

Dr. Copland describes the appearances of the throat and fauces as erysipelatous.

Sir Henry Holland, in his account of the peculiar affection of the mucous membrane, speaks of it as conjoined with “an adynamic state of system, one scarcely capable of maintaining true inflammation of parts, yet simulating the character of it.” “If a name were required to mark the nature of the inflammation, it might best, perhaps, be termed erythematous or erysipelatous in kind, having manifest relation to some of the various forms of these disorders.”†

In a much smaller number of instances, of which Cases V, VI, and VII are examples, the mucous membrane of the gums, tongue, palate, and pharynx exhibited peculiar appearances. In addition to redness and tumefaction, whitish or greyish-white membranous patches were observed. These patches, which were formed by sloughing of the epithelial layer, slowly frayed away, and were sometimes reproduced. In Case XIV, in consequence of the application of a fly blister, and after its partial healing, the peculiar specific inflammation was excited in the skin, and the part became covered with a whitish granular exudation.‡

If we accept the modern German definition of diphtheria as a necrotic inflammation, the phenomena just described display very close agreement, which cannot fail to suggest a near relationship between the two diseases, particularly when we add to these local manifestations the peculiar symptoms that have been recorded in the preceding pages—viz., the remarkable cardiac debility, even syncope itself, and the other neurotic affections among which motor weakness finds an illustration in a related case. This condition seemed to be nearly allied to diphtheritic paralysis. Among the records and annals of epidemic influenza, I have not discovered any reference to the appearance of so-called false membrane on the mucous surfaces. Dr. Parkes, in his article on influenza previously quoted, refers to attempts that have been made to trace out a connection between influenza and diphtheria. These attempts he evidently thinks unsuccessful,

* *Annals of Influenza*, p. 218.

† *Notes and Reflections*. Sir H. Holland. Third edition, p. 341.

‡ How much of these “false membranes” is due to sloughing and how much to exudation is difficult to determine.

yet it is noteworthy that, when treating of the morbid anatomy, he says—"Sometimes membranous exudations are found in the bronchi, not unlike those of croup."*

In a former part of this article we drew attention to the close resemblance that existed in course and symptoms between cases of *gastric influenza* and what has been described by Dr. Andrew Anderson, and also by other authors, as *gastric fever*. "More than most," says Dr. Anderson, "it is, I believe, connected with *effluvia*, emanations, that is, from decomposing animal matter which seem to me sufficient of themselves to produce the disease."

Again, the difficulty or impossibility of discriminating between cases of influenza without catarrhal symptoms in children, and cases of infantile remittent fever, was dwelt upon. And, further, the fact was recalled that some high authorities consider infantile remittent, even in its mild form, as identical with typhoid in the adult. Although not holding that these complaints are identical, we believe that they are very closely related in origin.

The Nature of the Poison of Influenza.—It has been already stated that the endemic form of a complaint offers superior advantages to the epidemic form, for studying the nature of its specific poison; just as repeated doses of mercury ultimately give origin to symptoms far more characteristic of the agent at work than one dose of corrosive sublimate, although the symptoms caused by the latter may be both more intense and more serious.

For this reason the endemic influenza, which has been prevalent in this locality, is worthy of study, in reference to the light thrown upon the nature of the poison. We specially invite the attention of the reader to Case VII. This case was not singular as regards the presence of any one symptom, but it exhibited a combination of severity with protractedness which was favourable to the characteristic effects of the poison becoming developed. Moreover, the patient, although elderly, was a very healthy woman, and during the whole course of her illness no visceral complication occurred upon which the poison might have spent its strength without revealing its characters. The noteworthy symptoms of the case were—Short incubation, rapid rise of temperature, fluctuation in temperature, extreme bodily and mental prostration, sensitiveness of surface to cold air, superficial necrosis (?) of the mucous membrane of gums, tongue, and palate; severe relapses occurring without discoverable source

* Reynold's *System of Medicine*. Third edition. Vol. i, p. 46.

(apart from the condition of the general atmosphere of the locality). On two occasions, at an interval of nearly three months, the relapses were accompanied by intense scarlet rashes; during the height of the rash, very high but greatly varying temperature. This assemblage of symptoms warrants the inference that this typical case was essentially one of *septicæmia*; and a careful examination of the different phases of the influenza which have come under observation confirms the opinion that the specific virus which causes the malady has its place in the class of *septic poisons*.

This conclusion is strengthened by the relationship which has been shown to exist between influenza and erysipelas, diphtheria and typhoid fever—diseases the germs of which admittedly have their origin, or, at least, their place of abode among the products of putrefaction.

(*To be Continued.*)

ON CERTAIN EPIDEMIC OUTBREAKS OF ENTERIC
FEVER IN APRIL, 1880, TRACED TO CONTAMIN-
ATION OF MILK, BEING A REPORT PRESENTED
TO THE POLICE BOARD OF GLASGOW.

By JAMES B. RUSSELL, Medical Officer of Health.

(*With a Lithographic Plate and a Woodcut.**)

I SHALL preface my detailed analysis of the late epidemic, or rather cluster of epidemics, of enteric fever in Glasgow, by a historic narrative of the facts as they presented themselves in the preventive treatment of the epidemic by the Sanitary Department. A distinct interest belongs to the two methods of dealing with the event. The slowly and laboriously accumulated evidence, which is massed in the order of an argument in the second portion of this Report, was anticipated in the action taken (as it must be to have practical effect), on the spur of the moment, after a rapid survey of

* The Report, as presented to the Board, is supplied with two additional lithographic plates, illustrating the arrangements of the farm house referred to in the text; also a map of Glasgow with the dairies concerned, and the deaths from enteric fever indicated in red ink. These are omitted here. Appendices containing correspondence referred to in the text, &c., are also omitted.

the situation. Besides, certain unexpected and unnecessary difficulties were thrown in the way of the preliminary inquiry, of which it is necessary that the public should be made aware.

Upon returning to the office on Saturday, 24th April, as the staff were leaving for the day (2 P.M. on Saturdays), I was informed by Mr. Macleod that Dr. Lapraik had called to report that, on the previous day and that forenoon, he had seen several patients in North Hanover Street, Cathedral Street, John Street, North Frederick Street, and Little Hamilton Street, who were suffering from gastric derangement, with febrile symptoms. He apprehended enteric fever, and had ascertained that *all* were supplied with milk from the same dairy—viz., Dairy 1 C. (see List in Appendix). Orders were at once issued for a house-to-house visitation in these streets, on Monday morning, 26th April. The result was to confirm and extend Dr. Lapraik's information. There was a contemporaneous crop of cases of febrile disease amongst the customers of this dairy. Several other practitioners had been summoned to such cases in their practice, and as they were not agreed in their ideas as to the precise nature of the ailment, some ascribing it to influenza, others to gastric irritation, or the nature of diarrhoea, I made a hurried run through the cases in Little Hamilton Street, and satisfied myself that, with those cases which were still indefinite in their character, others were associated which were examples of typical enteric fever. All were customers of —'s dairy. In our experience, the ordinary chronic causes of this fever, connected with derangements of drainage, never produce contemporary crops over an extended area, but only erratic cases. One of those isolated cases had occurred in the middle of February, in North Frederick Street, and had been made the occasion of the customary house-to-house visitation through those very streets in the latter half of that month, the records of which showed an entire absence of disease at that date, in the same houses which were now simultaneously invaded. Besides, this dairy did not monopolise the milk supply of the district. On the contrary, in High John Street, exactly opposite the east end of Little Hamilton Street, there was Hamilton's dairy, which was much more conspicuous, and did an enormous wholesale and retail business, yet none of the affected persons were customers of this dairy.

On inspecting —'s establishment, I found it scrupulously clean, conducted by Mr. —, his wife, a grown-up daughter, and a maid, who were in good health. They sold the product of 8 cows kept in a byre behind the tenement, with an added

supply derived from Mr. C— (Dairy 22 N. in List). In the house of a son-in-law of Mr. —'s, in the flat above the dairy, I found a child who had sickened *within the same period as the customers*. No doctor had been summoned, but the case was, to my eye, one of incipient enteric fever. This family was supplied only with C—'s milk, the product of the cows being, as usual in towns, in great demand, and therefore reserved for regular customers. I had observed that the other cases all got milk at a time when, most probably, C—'s milk alone was on sale, the home milk being sold, mostly delivered at the premises of customers, warm as soon as milked. The suspicious portion of the milk which Mr. — distributed was, therefore, that derived from Mr. C—. In the afternoon, when receiving the ordinary reports of the epidemic inspectors, information was brought in of cases of enteric fever in other parts of the town, north of the Clyde, and one of the men had heard that there was a severe outbreak at Possilpark. I ordered Mr. Armstrong, the dairy inspector for the western district, to call upon Mr. C—, with verbal instructions to inform him of the suspicion attaching to his milk, and to request a list of the farms from which he obtained his supply. This he did on the evening of the 26th April, but failed to see him. Next morning, about nine o'clock, he saw him, but Mr. C— refused to give me any information unless I promised not to publish names, or otherwise act so as to injure his business. He would meet me at the office of his agents, Messrs. — — — — —, at four o'clock, and would then, in the event of satisfactory conditions being accepted, give me the information asked. The attitude thus assumed by Mr. C— seemed to me so utterly inexcusable, and likely to be so serious in its results, that I thought it injudicious to enter upon verbal negotiations with the intervention of agents, which would leave no evidence which could, if need were, be published. I accordingly wrote at once to Mr. C—, stating the circumstances under which I made the request for a list of his farmers, objecting to conditions, and declaring formally that, as Medical Officer of Health for Glasgow, I found it was essential for the performance of my duties that I should immediately be informed of the names and addresses of the persons whose milk he, as agent, forwarded to Mr. —, at any time since the 1st of March last. I gave him until 10 A.M. next morning (28th April) to comply, and concluded—“Failing the reception of that information before that hour, I shall hold myself at liberty to send a copy of this letter to the

newspapers, or otherwise to bring your attitude, in reference to the health and life of the public, to the bar of public opinion."* Between four and five in the afternoon of the 27th, a letter was received from Messrs. ——, expressing surprise at the tone of my letter, as on a former occasion I had agreed to suppress his name in a similar investigation, stating that his wish was only to protect his own interests, and that on receiving this assurance, and on condition (1) that whoever might be employed on behalf of the Authorities to conduct the investigation would report to them, as agents for Mr. C——, from time to time the result of their inquiries, and (2) that should their client request any further investigation to be instituted, such should be undertaken by the Sanitary Staff, they were quite prepared at once to give me the list of farmers. On the forenoon of the 28th, I replied that, on the former occasion, Mr. C—— had received from me verbally that which I now gave in writing—the assurance, in general terms, that his interests would be respected by me so far as my duty to the public permitted. I claimed the information in the interests of the public, but pointed out that it was even more for his interest, as suspicion now lay at his door, and could only be removed by my inquiry, and that Mr. C—— had taken upon himself the responsibility of wilfully causing a delay of nearly two days, in an investigation in which, if the circumstances at all resembled those of the Hillhead outbreak, every hour lost meant injury to the public health. I refused to make any report of progress to them, as agents, but was willing to follow out any line of inquiry which they might suggest as likely to advantage their client, although I thought it unlikely that any essential part of my case would be overlooked. This letter was delivered by Mr. Armstrong, with instructions to wait an answer. He obtained a list of all the farmers who had sent Mr. C—— milk since 1st March, indicating three as the source of the morning and five of the forenoon supply sent on to ——; but the agents added—"It is, however, quite possible that —— may have got the milk of the other farmers."

We have now got to the afternoon of Wednesday, the 28th April. In the morning, after his unsuccessful interview with Mr. C——, Inspector Armstrong went out to Possilpark to

* In reference to this correspondence, while in the text I give such an abstract of it as to make a coherent narrative, that there may be no raising of questions as to its terms, I give it *ad longum* in the appendix. [Omitted from this reproduction.]

ascertain the state of things and inquire as to the milk supply. He found that a severe epidemic of enteric fever did prevail there, and that several dairies in the locality were supplied by Mr. C—. On Tuesday I had made out that Dairy 9 N., Possil Road, and Dairy 1 N., Springburn Road, which were associated with cases of enteric fever reported in their neighbourhood, also received a supply from C—. When I read the agents' statement that it was quite possible that — might have got the milk of the other farmers, I saw that the same statement must apply to all their client's retailing customers; and this association of outbreaks of fever, widely separate, as to locality, but apparently coincident in time, convinced me that one or other of the farmers was contributing infected milk to the stock of Mr. C—'s trade, and that wherever any portion of this stock went we might have fever, as in the case of —'s Dairy.

The most pressing object was to discover this farm. On examining the list I found it contained thirty names, widely scattered—as Biggar, Dumfries, Dunragit, Gartness, the places most distant, will show. Though the outbreak to be accounted for was now not only that attached to —'s supply, still the scent seemed to be hottest in that direction, and there was just time on the afternoon of the 28th, by train and driving, to ascertain the state of the three farms definitely stated as the source of —'s morning supply—viz., Wellflat, by Kirkintilloch; Blochairn, by Milngavie; and Carbeth Guthrie, by Strathblane. No suspicion was found to attach to any of these farms. The other farms were made out in itinerary lists according to locality, which were put in the hands of inspectors, with instructions to start on the 29th by the first trains.

The first farm on Mr. Inglis' list was situated near a station on the Forth and Clyde Railway. There he was told that a child had had "infantile fever," and a dairymaid was presently recovering from "childbed fever." He got back to town to report in time to permit of my return with him for a personal inquiry. The child, aged five, was pale and debilitated. "Infantile fever" is accepted as another name for enteric fever in a child. The dairymaid had not sickened of her present ailment until nearly seven weeks after her confinement of an illegitimate child—an interval which, to the best of my knowledge, was inconsistent with the reference of a febrile illness to the puerperal condition, which was implied in its description as puerperal or childbed fever. She was then quite non-febrile, but suffering from extensive bed sores.

She had fallen ill on 12th, the child on 25th March. The outbreak in Glasgow seemed to have begun about the middle of April. In view of all the circumstances, my opinion was that she had had enteric fever, which was communicated to the child, and that this was the source of the contamination of Mr. C——'s stock of milk. The internal structure of the farmhouse and the general arrangements of the steading were such as to leave no room for doubt as to the probability, much less the possibility, of such being the career of the contagium of enteric fever when introduced into the family. I therefore felt justified in requesting the farmer to send no more milk into Glasgow, which he readily agreed to. The last consignment was made on the previous morning (28th April). Coming to town about nine o'clock, I wired the information to Mr. C——. On the 28th I had informed Mr. Beattie, of the Barony Parish, of the relation of the milk supply associated with the Glasgow outbreaks to the Possilpark outbreak, with which his Board, as Local Authority, has to deal. It was a gratification to me to learn that Dr. Christie had been instructed to investigate that epidemic, as it not only insured a thorough inquiry, but rendered that co-operation which was necessary both certain and cordial. I informed him of the discovery the same night.

It is unnecessary to pursue the historic method further than to say that, though satisfied this was the source of the infection, the inspectors continued their visitation of the remaining farms, which they completed in a few days, without finding anything to cause suspicion as to any other.

Before entering upon the analysis and detailed statement of the facts of this epidemic, it may be well to say in general, that the greatest care has been taken in their collection, so as to make them complete, and in their verification, so as to ensure their accuracy. I must gratefully acknowledge the intelligent labours of Mr. Macleod and his staff, without which, cheerfully rendered and discriminately exercised under great pressure, my own efforts would have been useless. No case has been registered as fever without the certainty that it was so diagnosed either by a private practitioner or by myself. Every case thus verified has been recorded. Surrounding many indubitable cases of enteric fever there have been cases of allied sickness of a kind not found except in this association, which I have no doubt had the same specific origin. These have not been registered, though, as regards the propagation of the contagium, they are probably among the most dangerous and efficient agents, being disregarded and uncon-

trolled. All information as to milk supply was obtained from the heads of families, and details ascertained as to the kind of milk (sweet, skim, cream, sour), and the place, hour, and mode of getting it. Owing to the nature of the inquiry—which concerned the milk of an agent whose name was unknown in the locality, but to the persons interrogated referred only to the shop or dairy with which they dealt—the answers must be held to be entirely free of suspicion of adaptation, if indeed we could entertain any such suggestion in any case as possessed of the slightest show of reason. The invariable tendency of all such investigations is in favour of the offending milk—i. e., it is quite certain that every case of enteric fever recorded against it actually had the chance of imbibing it, but it is equally certain that every case which had this chance cannot be recorded, because of the want of evidence. People do not live in view of a scientific inquiry being at some future day made into all their domestic habits, their casual shoppings, and ordinary eatings and drinkings. This is especially true of the class of people among whom this epidemic chiefly prevailed—living for the most part in small houses, running no accounts, purchasing in small quantities, sending for their goods, using their children as their messengers. Consequently, if you have a poisoned article put on sale in a city, and especially if that article be one which must be got from day to day, and is in humble households sent for when required, you must expect that its effects will manifest themselves in unexpected quarters, that all the proof which can be produced of the source of the poison will in many cases be the presumptive evidence that *there* is the poison to be got for the asking, and *there* in convenient proximity is a person suffering from the effects of such a poison. I therefore claim the fact that here and there contemporary cases of enteric fever have occurred in families living hard by a suspected dairy, while they get their habitual supply elsewhere, and are therefore not put against that dairy, as one of the strongest arguments in favour of the alleged origin of this epidemic.

This brings me to another preliminary remark. It is well, before beginning a proof, to have clear conceptions of what facts our proof is required to cover. It is a common error, if it be not a favourite device, of opponents in a scientific controversy, to insist upon branches of evidence which are not essentials, but merely afford an opportunity of disparaging an argument by pointing to supposed defects in its scope. It is also necessary to be clear as to the terms we employ.

First, as to terms, it is not, in the scientific sense, the *cause*

of enteric fever for which I am in search. There is only one cause of enteric fever, and that is the specific, particulate contagium or seed. It is only the medium or channel by which this contagium was, in this special instance, distributed which I have to discover. That medium may be spoken of as the cause of the epidemic, viewing it as a distinct structure; and, for convenience, milk or any other medium may be referred to as the cause of enteric fever, but not with scientific accuracy. Obviously, therefore, no mystery need be made of the designation of milk as the cause of enteric fever. It is the innocent medium for the casual conveyance of the specific contagium or seed—the true cause. Therefore, milk in general is not to be expected to impart fever, because milk in particular is known to do so; and it must not be argued that, because milk in general does not impart fever, therefore milk in particular cannot.

Next, as to the scope of my proof. It follows as a corollary to the preceding proposition that milk is only a medium for the conveyance of the contagium, that there may be others, and that the action of milk does not imply that these other media are put in abeyance. Enteric fever is never absent from Glasgow, propagated intermittently by its diverse chronic media. These have been continuously active, before, and during, and since this epidemic. Therefore, besides that fringe of associated cases, really originating in, but not traceable to this epidemic, to which I have alluded, there must be an intermingled series of dissociated, erratic cases, having nothing to do with the milk supply, being simply the normal sporadic offspring of our chronic media. These are included in the area of the epidemic outburst like the fossil products of an old in the fresh deposits of a new formation. These I am not required to account for. Their existence is no argument against the milk theory. What I have to account for is a crop of cases springing up in certain areas with a certain symmetry as to time. These other cases occurred indifferently over the whole area of the city, and have no symmetry or coincidence as to time, except such as is derived from the inevitable intermingling of a sprinkling of the associated cases to which I have referred, whose very presence is a strong argument for the existence of the special circumstances in which the true epidemic originated.

Finally, I must also remark that, whatever may be said, milk is an established medium for the dissemination of enteric fever, recognised by the Legislature, beyond the region of discussion as a *vera causa*, and therefore I shall not waste

your time over the elaboration of features of this outbreak which are common to many outbreaks of the same kind which are on record, or expand details, as in the case of a previously unheard-of event it would be necessary to do.

For reasons which will be apparent in the sequel, I go back in the statistics of enteric fever to 1st April, and come down to the latest date—viz., Saturday, 29th May. The record of deaths possesses more value than that of cases, because it is certainly complete. Every death attributed to enteric fever is known. Taking the date of the occurrence of death, not the date of registration, I find that in all Glasgow, from 1st April, there were 69 deaths of inhabitants (exclusive of persons belonging to Possilpark, who died in Belvidere). In March, there were only 11 deaths. In those districts of the city lying north of the Clyde, there were 62 deaths; in those lying south, only 7. Taking those as the product of two months, this represents a death-rate per 100,000 inhabitants of 88 for the north, and 35 for the south, and brings out the most general territorial limitation of the epidemic. It was confined to the north of the Clyde, and Mr. C.—sends no milk to the south of the river. I shall therefore speak only of the northern districts. During the same period there were registered in the books of the department against this portion of the city, 508 cases, occurring in 372 families. During the month of March there were only 37 cases in 31 families. Spring is the season of minimum prevalence of enteric fever, so that such an outbreak was entirely abnormal.

If we take as the basis of a classification of these 508 infected persons the origin of their milk supply, and arrange them in two classes—those supplied from dairies or shops which retail milk wholly or partly obtained from C—, and those from dairies or shops which retail the milk of other agents, we find 373 cases and 257 families in the former class, and 135 cases and 115 families in the latter—that is to say, 73 per cent of the cases, and 69 per cent of the families, were customers of the suspected dairies. Similarly classifying the deaths registered in the northern districts, we find 36 related to the suspected dairies, and 26 to those not suspected—i. e., 58 per cent of all persons who died of enteric fever since 1st April were customers of Mr. C.'s shops. We have here the first glimpse of relationship shown in a rough way. Let us apply the tests of time and locality to the two classes.

The date of sickening is of prime importance in all specific diseases, because it marks the springing into activity of the specific contagium or seed, and enables us to approximate to

the still more important date of the implanting of the contagium in the body. In searching for the medium of conveyance of the seed, of course, we are able at once also to ascertain in each case whether it is possible that the medium could have so acted. If the person sickened before the medium was infected, then no such conveyance could have taken place. The first of the 373 customers of C—'s shops sickened on 9th April, and, day by day, a few more or a few less, they sickened in numbers—on the whole increasing, until the maximum of 38 was reached on 23rd April, after which date the numbers fell with similar fluctuations, the last of which was to 10 on the 4th May, tapering off, until, in the last fortnight, a few secondary cases have appeared in houses where the first persons affected were treated at home. This symmetry of structure will appear from the weekly numbers. In week ending 10th April, 2; ending 17th, 42; ending 24th, 151; ending 1st May, 123; ending 8th, 33; ending 15th, 12; ending 22nd, 4; ending 29th, 6. When we turn to the 135 customers of the miscellaneous dairies, we at once are made aware that we have passed from the sphere of one cause to the region of many—from uniformity to chance and accident. The first sickened on 3rd March, and, day by day, with occasional blanks thereafter, they fell ill by ones and twos and threes, sometimes reaching six and seven. This asymmetry will appear from a few weekly numbers, parallel to those given above. In week ending 10th April, 11; ending 17th, 11; ending 24th, 24; ending 1st May, 23; ending 8th, 19; ending 15th, 10; and so on. You will observe, however, that there is a decided increase in those cases coincident with the acme of the epidemic. Familiar as I am with the position and circumstances of each case, and aware of the chance detection of relationships with infected dairies which have transferred other unassociated cases into the list of the associated, I have no doubt this is evidence of the truth of what I already said, that, given a poisoned article of food for sale, and many more will be poisoned than can ever be traced. For example, among the unassociated cases there are two young men, who were clerks out at Possilpark, who sickened at the very height of the epidemic; there is also a young wife, who frequently visited her mother, living in Little Hamilton Street, where, on one occasion for certain, she drank milk from Dairy 1 C. Until the fact was discovered, there was also among the unassociated a grocer's assistant, who daily washed down his lunch with a tumbler of milk bought at an infected dairy, though his home supply was from a pure source.

Returning to the 373 symmetrical cases, let me ask your attention to this rough diagram, the black columns in which indicate, by the relative proportion of their height, the number who sickened each day. You observe how gradually they rise to an acme, and then dwindle away. Remember, the dissemination of the specific contagia is strictly analogous to the sowing of seed. If it were possible to note the appearance above ground, day by day, of the green blade from each individual seed, late or early, as it had been favoured or kept back by the little circumstances of its position in the soil, and if you made a diagram to represent the result, it would bear exactly this aspect. There is no possibility of keeping out of the mind, as we look at the fever diagram, the conclusion that it exhibits the fruit of an act or acts of sowing broadcast of the fever seeds among the population whose sickness is there depicted. Where shall we find the medium which was in contact with all, and might therefore convey those seeds? Air, water, sewers, drains; all are either too wide or too narrow. (See "Fever Calendar" at the end.)

This will become more obvious when we consider the local distribution of this epidemic. On 8th May, after we had formed, under the guidance of the fever which surrounded them, a long list of shops supplied by Mr. C——, I wrote to his agent asking a list of all the shops so supplied, which I received three days after. We found, on comparing this with the office list, that there were only a few which we did not already know, that there was one omitted from the agents' list which was correctly (as was afterwards admitted) upon ours, and that altogether, as to names of persons and numbers of streets, the office list was the more accurate of the two. As finally adjusted, there were found to be 39 retail customers acknowledged by Mr. C—— besides his own dairy, within the city bounds, and 8 in Possilpark. There were therefore at least 40 channels by which his milk reached the public of Glasgow at the date of this outbreak. These are indicated by red stars on this Post Office Map, and are, as you will observe, scattered over the four sanitary administrative districts north of the Clyde; but more than half, including the agent's establishment, are in the northern district, with the dairies in which 66 per cent of all the cases are associated. It is impossible to show the cases upon so small a map, but I have had *all* the deaths which have occurred in the city since 29th April (when the first death from this milk epidemic took place) put down at the place of residence of deceased, the red dots indicating deaths connected with the milk (37

in number), the small red stars those not known to be so (22 in number). I only wish you to observe how widely scattered the small red stars are, and how suggestively the red dots cluster around the large red stars. Indeed, the officer who laid down the dots complained that the stars representing dairies covered many of the places where he wished to put them, and so they are placed at the nearest point clear of the stars.

On allocating the cases among the 40 dairies, it was found that 30, including Mr. C——'s own establishment, had fever among those who used their milk, and 10 had not, so far as known. Of the 10, 1 is only an ice-cream shop; the quantity taken by all is very small, only from 1 to 3 pints* of skim and sweet, with a little cream. Still, there are other shops taking as small a supply which have associated cases. These occurrences belong to the category of hits and misses, which are familiar to all who study the ways of the contagia in their distribution, and are a proof of the theory rather than a difficulty in the way of its acceptance. Some of these dairies formed local epidemics, surrounding them singly or in groups, sufficiently defined to be spoken of as epidemic areas. To one of these we shall refer in detail.†

The Springburn Road Area.—This is a very important area in this respect, that dairy 1 N. is situated in a detached block of tenements opposite Sighthill Cemetery, to which its custom is entirely confined, but in which a large majority of the families are customers of other dairies retailing milk from other sources. A milk-census was taken over this area, and with this result:—

Customers of Dairy 1 N.,	37 families,	of whom 15 are infected, yielding 24 cases.
Do. another Dairy,	198	do., No fever.
Do. 10 other Dairies,	53	do., of whom 1 infected, yielding 1 case.
Using no Milk,	4	do., No fever.
Total,	292	
Houses empty or shut, . .	101	
Total Houses in area, . .	393	

* Whenever I speak of pints it is the Scotch pint which is meant, or half a gallon imperial.

† In the original Report three areas are given in detail. Two of them are here omitted for the sake of brevity.

So that in this area, out of 292 families, dairy 1 N. supplied milk to only 37; yet the fever fell upon 15 of those families, while of the remaining 255 all but one escaped. That one case sickened on 14th May, and therefore did not belong to the epidemic outburst, but is probably a secondary case. In fact, it occurred in a house which had been rendered vacant by the death of the previous tenant of enteric fever early in the epidemic. Only one meaning can be got out of these facts, and that is, that the contagium of enteric fever was contained in the milk distributed from dairy 1 N., and that was obtained from two sources—an early morning supply of 4 pints sweet, 4 pints skim, and $\frac{1}{2}$ pint cream, delivered by C—; and a later supply of 12 pints sweet, 20 pints skim, and $1\frac{1}{2}$ pints cream, brought direct from the farm by another agent.

I shall not prolong this part of my Report by going over the minor areas formed by the other dairies. Of course, the reason for attributing the few cases associated with certain of the dairies is to be found in the demonstrated infectiousness of the milk therein retailed, based upon the large induction of the dairies in the areas specified above, and their coincidence in time. Special attention is directed to the fact that there are 17 cases among the customers of Mr. C—'s own shop (22 N.), and 15 among those of his brother, 7 E. There are also 3 cases of direct infection from Mr. C—'s cart at 27 Port-Dundas Road, where there are 7 families (2 houses empty), of whom 2 are supplied with sweet milk every morning (apparently unknown to Mr. C—, who says his carts do not retail), and they alone are infected.

I conclude what I have to say in proof of the properties of this milk, by pointing to an extraordinary feature of this epidemic in relation to the shops or channels through which it passed to the public—*i. e.*, the number of cases in the families or households of the vendors. There were 40 shops, and of these no less than 12 were themselves infected. The following are the particulars:—(The figures refer to the map.) 2 E., a son ill; 1 C., two grandchildren; 1 N., 3 daughters; 6 N., a daughter; 11 N., 2 sons; 13 N., a son and daughter; 15 N., the proprietor and a lodger, and all the children were sickly also; 16 N., a daughter; 19 N., a son; 21 N., a son and 2 daughters; 22 N., a daughter, and all the other children sickly; lastly, in Mr. C—'s own establishment, a dairymaid. These cases gave me much trouble and caused a deal of anxiety. But for the strict and somewhat stern enforcement of measures which ensured absolute isolation of the patients from the retail

trade, the infection might have been reduplicated with disastrous results. During the period under review I know of only one dairy or milkshop in the city, where febrile sickness existed which was not supplied with C—'s milk, and in that instance the disease was dubious in its nature; but all those enumerated were marked cases of enteric fever—mostly, indeed, unusually severe. In order to ascertain if any similar misfortunes attended the retail shops of other milk agents, I applied to Mr. Brand, of Devon Street, and Mr. Hamilton, of N. John Street, two of the most extensive dealers in the city, for lists similar to that furnished by Mr. C—, which they were obliging enough to give. On Mr. Brand's list there were 40 shops, on Mr. Hamilton's 51, situated in all parts of the town; and after a systematic visitation and inspection of each one, I found that good health prevailed all round, at any rate so far as infectious diseases are concerned; and random house-to-house visits in their neighbourhood disclosed no fever among their customers.

From the last letter in the correspondence we learn that Mr. C— distributes his milk by means of three carts having distinct routes. The shops served by each cart are indicated in the list of dairies appended, from information supplied by Mr. C—. It is obvious that the infection was not associated with any one cart in particular, although cart No. 3, having on its route shops with but a trifling trade comparatively, has the smallest number of associated cases. Cart No. 2, which supplied dairy 1 C., is the same from which the private parties in Port-Dundas Road got their sweet milk, and which conveyed the milk to the 8 dairies in Possilpark.

I shall only add under this head that Dr. Christie has been good enough to put into my hands a tabular statement of the details of the Possilpark area. I shall only say in general that they show complete harmony with my argument. I hope, therefore, I have said enough to convince you that, wherever Mr. C—'s milk acquired the specific infection of enteric fever, it certainly did possess it. It is not too much to say that the entire body of his trade during the period under review was tainted. It is associated with fever in his own household, in persons served direct from his own cart, it poisoned the families of the dealers through whose shops it passed to the public, and it poisoned the customers who dealt with those shops.

Let us now turn to the farm of —, and see how the events which happened there agree with the assertion that it was from thence this infected element in Mr. C—'s

business proceeded. Before entering upon the following narrative, it is right to say that the difficulty of fixing dates and getting at this consecutive history was enormous. The officers of the department, Mr. Inglis and Mr. Dobson, have been several times at the farm, and through the district. I spent a whole day driving about there myself, besides corresponding with the parties concerned, and I have taken every possible precaution to put my statements beyond question. I acknowledge with pleasure the frank and friendly way in which I was met, as well as written to, by the three medical men concerned in this narrative.

In this rough diagram, or "Fever Calendar," the whole story is compendiously displayed, so that, as nearly as possible, you may see as I proceed the course of events, and their relation to the facts already before you.

In the first place, the epidemic comes quite within the period when milk was being sent from this farm into Glasgow. The facts are singularly exact. The first milk for the season was despatched on 26th March, the first case sickened on 9th April. Thereafter this milk was sent in at intervals of two to four days, several of the 12 cows being yeld, so that it took that time to accumulate a sufficient quantity. Each successive milking was creamed and stored, and the whole was sent off as skim and cream. As the dates and quantities are of great importance, I give them as furnished by the farmer.* In the diagram the quantities are inserted opposite the date of despatch.

March 26th,	...	3 Butts,	...	11 Gallons.
" 29th,	...	2 "	...	5½ "
April 1st,	...	2 "	...	7½ "
" 5th,	...	2 "	...	7½ "
" 8th,	...	3 "	...	10½ "
" 10th,	...	2 "	...	7½ "
" 12th,	...	2 "	...	7 "
" 14th,	...	3 "	...	10½ "
" 17th,	...	2 "	...	7½ "
" 19th,	...	3 "	...	12 "
" 21st,	...	2 "	...	7 "
" 23rd,	...	2 "	...	7 "
" 26th,	...	2 "	...	12 "
" 28th,	...	2 "	...	7½ "
Total,				120 Gallons.

* As will be seen from the correspondence, this statement is admitted by Mr. C—to be substantially correct.

The next question is, Was the specific contagium of enteric fever within reach of this milk? Did it exist at—? This narrative gives the answer. On 26th January, 1880, a servant girl, Jane N—, who had for some weeks been awaiting her confinement in her mother's house, in the village of Bucklyvie, was delivered. She made a good recovery, and on Monday 23rd February (28 days after) was able to enter service at the farm of—. She continued well until 12th March (46 days after confinement), when she became feverish and ill. Her illness proved long and severe, as was evident from her condition, as already described, when I saw her on 29th April. She was visited by two medical men, one the parochial officer, who saw her at the first, and took over the case at the last, prior to her removal to the poorhouse; but she was attended, during her illness, by — — — the — family doctor. To make a long story short, he writes,—“When I first saw the girl at —, she was suffering from pelvic cellulitis, going on to abscess. * * * Thereafter I believe she had enteric fever.” The girl's mother, who nursed her throughout, states that she had severe diarrhoea, and was at one time in an absolutely helpless condition, as indeed was sufficiently evident from the extensive bedsores.

The next event was the sickening, on 25th March, of Thomas and John, children of the farmer, aged 3 and 5 years respectively. The mother says, “John never lay an hour,” but the medical attendant writes me that both had “infantile typhoid.” Thomas is the child I saw in a very sickly condition at my first visit. He was extremely ill, and in fact was not expected to survive.

So much for the residents at the farm. At the outset of Jane's illness, which seems to have been very sharp, she sent for her mother to Bucklyvie, but not being able to leave at once, the mother sent another daughter, Margaret, aged 15, who reached the farm on the morning of the 17th March, and remained until the 18th, when she was replaced by her mother. This girl got her meals at the farm, and had milk to her potatoes on the 17th March. She sickened at Bucklyvie on the 1st April, and passed through what Dr. Stuart writes was a typical attack of enteric fever. I saw the girl on 14th May, when she was still much debilitated.

The next event takes us back to — —, a little house a few minutes' walk from the farm, on the opposite side of the road and of the ridge along the top of which the road runs. Mr. —, who lives there, keeps a cow, but it began to get yeld in the beginning of April. It calved on 23rd May. I

have, in every conceivable way, endeavoured to get at a precise date for the time when Mrs. —— first began to supplement her cow's yield, and then regularly to take her pint of sweet milk from —— farm, when her cow became dry. It was paid for as got, and there is nothing but memory to refer to. The farmer says she took no milk until the *end* of April, but that is certainly a mistake. One statement of Mrs. —— is that she got milk first three weeks after the Killearn school examination. Now, that was on 2nd March, and this gives 23rd March as the date. Another statement is, that it was before her boy John's arm was broken. The doctor tells me he saw this arm on the 10th April. But she admits that whenever she began her *regular* purchases, she previously got "drops of sweet milk" on three or four occasions; and here again, I say, people do not live, especially in the country, in anticipation of a scientific inquiry into those trifles which have become exalted into tragical importance. You have a cow becoming yeld, and five young children requiring milk, and a farm where milk is to be got at hand. The rest follows as a matter of course. At all events, Mrs. —— is quite sure that *before* her children sickened she had been getting this milk. There are two facts that point to the date of sickening, which is equally difficult to get at directly. The four children who fell ill did so almost together. Three are at school, and the school attendance record shows that one disappeared on 2nd April, and two on 9th; while the doctor, who saw the broken arm on the 10th, says they were then all ill, and that, in his opinion, the disease was *enteric fever*, but of a mild type. At the date of my visit—viz., 14th May, the eldest daughter had risen for the first time, and was much debilitated.

Turn now to our rude chart, and let us read the whole history. The dates of delivery of the milk, of the sickening of those persons at the farm and in its neighbourhood, and the daily numbers sickening in the Glasgow fever areas, are all indicated, so as to make a calendar. You observe the dairymaid sickened on 12th March, her sister slept a night with her, and partook of milk on 17th March, and sickened exactly 14 days thereafter; the two children sickened on 25th March; on 26th March the first lot of 11 gallons of milk was sent off to Glasgow; exactly 14 days thereafter the first case in the area of Mr. C——'s milk supply sickened, and at ——, Mrs. ——'s four children fell ill.

I used the analogy of the sowing of seed as illustrative of this epidemic. I said that the interval between the sowing

and the appearance of the green blade corresponded to the period of incubation between the reception of the contagium into the body and its interference with health. Now, suppose a handful of seed thrown broadcast over the soil by one act, if we chanced to note the date of appearance of each blade, and had by previous observation ascertained the average period after sowing at which such appearance occurs, we could, by going back that distance from the day on which most of the blades appeared, fix very nearly the actual date of sowing. It is exactly the same with diseases whose seeds can be sown. We know how many of these 373 cases sickened each day. Fourteen days is the average interval of incubation of the seeds of enteric fever; let us dislocate, so to speak, the events in this calendar from their dates, and shift them back 14 days. This is done, and the numbers sickening are indicated by the proportional height of the black columns. Margaret, we know, without any guessing about it, partook of milk on 17th March, and fell ill 14 days after. Whatever else was the medium about the farm, which might have conveyed the disease to this girl, the milk alone could convey it to Mrs. —'s children, as there was nothing common to the two houses but the milk. They stand on opposite sides of the watershed. Yet, whoever went personally to this farm-steading, or lived there, came within the sphere of all the local influences, and all that can absolutely be said is, that something there, immediately on Jane's illness, acquired infecting power. As to the illnesses represented by the black columns, there can be no question. The milk was sent to those who took ill. It was the only thing common to those persons and to the farm. You will observe that the maximum of sickening comes opposite the 10th of April, when the children and the girl were all ill together. You will also observe that there are evidences of more than one act of sowing evidently related to the successive deliveries of milk. It seems to me probable that each lot was infected from the first on to that sent off on the 14th, and perhaps also the 17th, April.

There can be no doubt, then, that the specific contagium was within reach of the milk, and that it got into the milk. It now only remains to inquire what evidence the structure and general arrangements at — afford of facilities for such an occurrence. The farm has a bad health history. The farmer stated that, 20 years ago, he had typhoid fever, but it was brought, he says, by a sister's family coming there from Glasgow, after having that disease. This satisfies Mr. —,

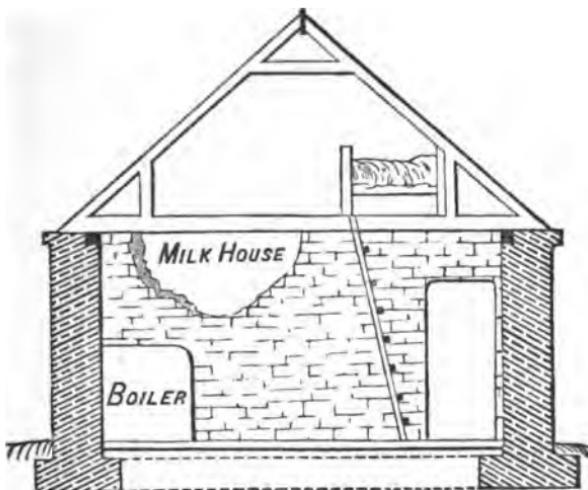
but it shows that there was something radically wrong at his farm nevertheless. Nine years ago diphtheria attacked the family. There were five cases and two deaths. Again, it is alleged that the disease was brought from Glasgow by convalescent relations. In the beginning of 1879 a maid took enteric fever, was treated at the farm, went subsequently home to Bucklyvie, and thereafter her mother and sister fell ill. The sister died of the fever on 4th February, 1879. Again, it is alleged that the disease was brought to the farm, as another sister was ill at home before the servant took it. The medical man who attended and certified this fatal case, tells me that, previous to this occurrence in 1879, he had seen a man-servant who had taken the same fever at this farm in that year. We cannot be surprised at such events when we look at this isometrical plan of the steading drawn by Mr. Dobson.* I merely direct attention to the most important facts for our present purposes. The milk house, washing house, kitchen, and living apartments are all *en suite*. The washing house is only a part of the milk house, or *vice versa*, as we choose to take it, separated by a slim wooden partition, and the boiler for washing and for scalding tins is in a recess in open connection with both places. The room where the children lay is the bed-room next the kitchen. The dairymaid passed through her illness above the milk house and washing house, in a garret, the steep ladder leading to which is shown in the plan. The bed stood towards the front over the washing house, and the stains upon the floor, visible to my eyes on 14th May, bore evidence to the severity of her illness and the attendant risks. The excreta were thrown over the dung-heap. The privy shown at the end of the byre is an erection which is in such a state of dilapidation that no person having a remnant of decency could use it.

The well is sunk in the ground in the position shown, 12 feet 5 inches in sand and gravel. It is well lined with brick, and was found to be clean when opened. The bottom of the well will be seen from this sectional diagram to be 3 feet below a pool of stagnant water, and considerably more below the dung-heap which extends over the slope. When examined by Mr. Dobson, the water level was slightly higher in the well than at the pool, but still the circumstances are not satisfactory. Dr. Wallace's report on the analysis of the water is appended.

* The ground plan and section of the farm referred to in the text are omitted here, but the woodcut on the opposite page shows the relation of the washing house, milk house, and garret where the dairymaid passed through her illness.

He states—"I am of opinion that it is contaminated to a small extent with animal products. As, however, these are almost completely oxidised, and so rendered harmless, the probability of disease arising from the use of the water is somewhat limited." This simply means that there is a soakage from this dung-heap and pool into the well, but at the time this sample was taken, it was so small in quantity that the intervening sand had been able to oxidise it.

The small blue patch shows the position of a dip-well at the foot of the green slope, and in open communication with all the sodden marshy area leading to the manure heap. It was there that the dairymaid's mother washed overnight the soiled



[THE WOODCUT SHOWS A CROSS-SECTION THROUGH THE RECESS IN WHICH THE BOILER STOOD,
AND WILL GIVE A CLEARER IDEA OF THE ARRANGEMENTS.]

changes from her daughter's sickbed. The pump is out of fang, and when the farmer wished to pump up a little water for inspection, he set it working with some dirty-looking water. Taking into account the requirements of human beings and cattle, for washing clothes, scalding tins, and other domestic purposes, along with the shallowness of the pump well, and the difficulty of getting at the water, there seems an evident risk that at times the water of this dip-well might be brought to the house for certain of these purposes, but I am assured that it was used only for washing, being a softer water.

Perhaps you may expect me to conclude by entering into
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the question how the contagium got into the milk, but I shall leave you to put your own construction upon the circumstances into the midst of which I have traced this portion of Mr. C.—'s supply. In such cases you must first ascertain all the conditions under which the household life or business is usually carried on, then introduce the disease into the sphere of these activities, and imagine the result. I therefore leave you to imagine for yourself—from all you know of serious illness from enteric fever, from the equally dangerous circumstance of a child who “never lay an hour,” although it had the same fever—under what conditions the milk must have been, first milked, then set out to cream, and stored for days in that milk house in the months of March and April. In setting for cream, the largest possible surface is exposed. The result was, as the sequel showed, to produce a virulent poison—a sort of essence of fever. I can only account for the strength of the infecting power by supposing that during storage the contagium multiplied in this animal fluid, as it does in the blood, and as other contagia can be made to do for experimental purposes in artificial fluids, not unlike milk in composition in some respects.

There is one matter, however, which merits some more minute consideration. The articles delivered to Mr. C.—from this farm were skim milk and cream, so that primarily only those articles, as sold to the town vendors and consumers, ought to have conveyed the infection. If reference is made to my correspondence with his agents it will be observed that an attempt is made to prove (1) that no — milk reached Dairy 1 C.; and (2) that it was very improbable that any of it could have reached anybody in its primary condition, as it was all or nearly all churned, “as he did not look upon it as good keeping milk, and preferred letting his customers have better”—a statement which, it may be remarked by the way, implies some obvious physical peculiarity about this milk which is suggestive of unwholesomeness, or at least suspicious inferiority.

In neither of these efforts has Mr. C. been very successful. As already pointed out, under date 28th April, in transmitting the list of farmers, while indicating those farmers whose milk probably reached Dairy 1 C., he adds, “It is, however, quite possible that — may have got the milk of the other farmers,” one of whom was the owner of —. That stands as his opinion, when neither he nor I had any idea which of the number was to be suspected. Besides, one of the five farms against which the agents marked a cross to show that —’s

forenoon delivery "most likely" came from them, was situated near Balfron, so that his milk came by the same train on the same line of rail, and was delivered at the same station (viz., Queen Street), as that from —. Yet, under date 30th April, the agents are instructed to say that "Mr. C— does not think that any of this milk would be delivered to —, as it was sent to Glasgow by the N. B. Ry., delivered at Queen Street." We are told that "the carts lift from Buchanan Street first, and on their way to Queen Street*" were in the habit of calling at —'s, so that he would only get Buchanan Street milk." After further inquiry, he subsequently (1st May) "states positively that none of —'s milk, during March and April, was delivered to —;" but we are also told (correspondence under date 7th June), that "—'s milk was checked at Mr. C—'s premises in St. George's Road"—i. e., before being distributed it was driven from the station to these premises and measured. What then can be the meaning of suggesting that the possibility of —'s milk reaching Dairy 1 C. had anything to do with the route which the carts followed in lifting the milk at the two stations?

Next, as to the churning, which, it may be remarked, is in all probability a disinfecting process, owing to the acid products. Also under date 30th April, the agents are instructed that "since —'s milk came, in March, Mr. C— churned almost daily an average of 100 gallons, or perhaps rather over that amount;" and for the remarkable reason referred to above, "Mr. C—'s impression is that —'s milk was almost always churned." This is a very frail basis for a fact which was to determine the treatment of an article, even the exceptional use of which in its original condition was sufficient to poison and to produce all the results which I attribute to it. In next letter (1st May) the "impression" has not become more robust. The final statement is this—"Though Mr. C— is not able to say that on every occasion —'s milk was churned, he is almost certain that it was so. *It may, however, on an odd day or so, have been disposed of among his customers along with his other milk.*" This is quite sufficient to account for all the facts. Like Mercutio's wound, "'Tis enough, 'twill serve."

Skim milk and cream being the infected articles, let us look somewhat more closely into the sorts of milk with which the persons infected were supplied. This information was carefully collected from the lips of the heads of families. In the northern district there were 254 cases, regarding 9 of which,

* The *italics* are mine.

for various reasons, no information could be got, but of 245 the supply was stated to be as follows :—

Sweet, Skim, and Cream,	...	...	...	85
Sweet and Cream,	...	...	...	54
Sweet and Skim,	...	...	...	60
Cream and Skim,	...	...	...	6
Sweet only,	...	...	...	37
Skim only,	...	...	...	2
Cream only,	...	...	...	1

245

so that 37 persons were infected who alleged that they only used sweet milk.

This is a survey of the business of all the shops, but there are 9 of those whose proprietors stated that they sold Mr. C——'s milk only (viz., 6, 10, 11, 12, 13, 15, 18, 20, all North). All but one (who got sweet and cream) got the three articles, and all had associated cases of fever—in all 60 cases. Regarding one no particulars could be obtained, but the statements of the remaining 59 infected customers are—

Sweet, Skim, and Cream,	...	...	...	19
Sweet and Cream,	...	...	...	11
Sweet and Skim,	...	...	...	18
Cream and Skim,	...	...	...	4
Sweet only,	...	...	...	6
Cream only,	...	...	...	1

59

so that 6 persons were infected who alleged that they used only sweet milk bought from shops which retailed Mr. C——'s milk only.

As already stated, 17 cases were associated with Mr. C——'s own shop. The particulars as to these are as follows :—

Sweet, Skim, and Cream,	...	...	...	7
Sweet and Cream,	...	...	...	4
Sweet and Skim,	...	...	...	2
Cream and Skim,	...	...	...	1
Sweet only,	...	...	...	2
Skim only,	...	...	...	1

17

so that 2 persons were infected who alleged that they used only sweet milk bought at Mr. C——'s own shop. To the

same class belong the 3 remarkable cases in Port-Dundas Road, which occurred in two families who got a daily supply of *sweet milk, and sweet milk only, direct from one of Mr. C—'s carts.* One dairy (viz., 16 N.) is said only to get 11 pints of sweet milk from Mr. C—, and with it there are associated 8 cases of fever, 3 of whom purchased sweet and cream, 3 sweet and skim, and 2 sweet only.

The explanation of these facts involves delicate considerations. The simplest is that afforded by the practice of using the same measuring tins for checking the invoices of sweet and skim milk, and the same measures for serving customers with those different milks.

There are one or two additional points in these epidemics which might be elaborated, but for the present I shall refrain. I had intended to say something about the necessity of measures being taken for the prevention of such occurrences; but if, after reading this narrative, we place clearly before our minds two propositions:—(1) That none of this sickness and death would have occurred in Glasgow but for a combination of circumstances in the country, of which those sicknesses and deaths are the natural outcome, but which were nevertheless clearly preventible; (2) That similar combinations of circumstances may again take place at any moment at scores of farms which are equally ripe for the event, surely nothing more need be said. As time passes, the scope and power of milk as a medium for the distribution of enteric fever in towns is gradually being demonstrated. This seems to be the only path by which the public mind can reach the point of action. It remains to be seen whether this, the last and worst of the many milk epidemics from which Glasgow has suffered, will suffice to bring the mind of the Glasgow public to that point. From the date of the first detection of milk as a medium, it was only necessary to know the sources of the milk supply of towns, the mode in which it is collected and distributed, to be able to predict all that has now been learned by dire experience. With that experience, the prediction of equal, if not greater, developments of the latent powers of this medium under possible circumstances, if some measures of self-protection are not adopted, is a very safe act of prophecy. I shall only add that I go heartily with the principle of Sheriff Spens' draft "Act for the Sanitary Regulation of Places of Milk-supply to Towns."

ON AN OUTBREAK OF ENTERIC FEVER AT POSSILPARK.

(*Being part of a Report to the Local Authority of the Barony Parish, Glasgow.*)

BY JAMES CHRISTIE, A.M., M.D., Medical Officer of Health, Hillhead.

AFTER stating certain facts as to the origin of this inquiry, and entering into some details in regard to the drainage and water supply of the district, the Report proceeds:—On carefully examining the local distribution of the cases of enteric fever in relation to the drainage of the district, and the water supply thereof, I can detect no relation whatever. The exact position of every house infected is marked on the plan before you, and I may state, in addition, that exactly one half of the infected houses were situated on the ground and first flats, and one half on the second and third flats.* There was no reason, therefore, to institute a more minute examination as to the structural condition of the drains and cisterns than that made by Mr. Buchan, in a few cases, as samples of the whole.

During the course of this investigation my attention was called to several alleged nuisances, such as free coups, ash pits, &c.; but, without entering on the question as to the extent and nature of such alleged nuisances, I can safely say that such had no connection with the diffusion of the epidemic.

I now come to the question as to the relation of the milk distribution to the enteric fever distribution.

I find that the 4,816 inhabitants of Possilpark are supplied daily with over 376 quarts of sweet milk, 274 quarts of skim milk, and 54 quarts of cream daily. The sour or butter milk supply amounts to over 226 quarts daily. Of the 986 families, 5 use condensed milk; 24 butter milk only; 21 no milk at all; and regarding 54 families, no definite information was obtained.

Nearly all the milk used is supplied by 14 dairies or milk shops, and by two carts—a few families being supplied from sources outside the district. A considerable portion of the milk is delivered at the houses of the people; but the greater number of families send for it to the dairies as required, the younger members of the family being, as is usual in such cases, the messengers. This mode of delivery forms a very important element in an investigation of this kind; for when milk

* The ground and first flats were supplied with water from the mains; while those on the second and third flats were supplied from cisterns under the roof.

is delivered at the house of the customer there can be no doubt as to its source; whereas, when a child is sent for milk with the money to pay for it, it will occasionally be purchased at the nearest place.

In my preliminary remarks I mentioned that, at the very outset, I had reason to suspect that the milk issued from several of the dairies in Possilpark had been contaminated with the contagium of enteric fever. These dairies, for convenience of reference, I shall designate X1, X2, X3, X4, X5, X6, X7, X8. I also mentioned that there was reason to suspect that the contagium of enteric fever gained entrance to these dairies in Possilpark through the milk of a wholesale dealer in Glasgow, whom I shall also designate, for convenience of reference, Mr. X.*

Dairy X1 received its sole supply from Mr. X, and disposed of to 52 persons in 12 families, 2 quarts sweet milk, 4 quarts skim milk, and 1 quart of cream daily. There was also a weekly issue of 24 quarts of butter milk. No one supplied from this dairy had enteric fever.

Dairy X2 received its sole supply from Mr. X, and disposed of to 143 persons in 30 families, 6 quarts of sweet milk, 6 quarts of skim milk, and 2 quarts of cream daily. There was also a weekly sale of 60 quarts of butter milk. 15 persons who obtained their milk from this dairy had enteric fever.

Dairy X3 received its sole supply from Mr. X, and disposed of to 222 persons in 46 families, 10 quarts of sweet milk, 6 quarts of skim milk, and 1 quart of cream daily. The weekly sale of butter milk was 12 quarts. Amongst those supplied from this dairy there were 8 cases of enteric fever and 1 death.

Dairy X4 received its sole supply from Mr. X, and disposed of to 59 persons in 13 families, 4 quarts of sweet milk, 8 quarts of skim milk, and 1 quart of cream—2 quarts of the latter on Sundays—daily. No butter milk was sold. Of the customers of this dairy 10 had enteric fever and 1 died.

Dairy X5 received from Mr. X 10 quarts of sweet milk, 4 quarts of skim, and 3 quarts of cream daily; and, from other sources, 14 quarts of sweet milk, 16 quarts of skim milk, and 2 quarts of cream daily. There was a daily sale of 24 quarts of butter milk. The milk was distributed in 62 families to 329 individuals, amongst whom there were 13 cases of enteric fever and 3 deaths.

* Mr. X. in Dr. Christie's Report, is the Mr. C. in Dr. Russell's Report.
—Ed.

Dairy X6 received also a mixed milk supply as follows:— From Mr X, 8 quarts of sweet milk; from other sources, 24 quarts of sweet milk. In addition, 52 quarts of butter milk were sold daily, but neither skim milk nor cream were sold. The milk was supplied to 190 persons in 38 families, and 16 persons had enteric fever, of whom 1 died.

Dairy X7 received its sole milk supply from Mr. X, and disposed of to 142 persons in 30 families, 16 quarts of sweet milk, 16 quarts of skim milk, and 3 quarts of cream daily. The daily sale of butter milk was 60 quarts. Of those supplied by this dairy, 12 sickened of enteric fever.

Dairy X8 received its sole milk supply from Mr. X, and disposed of to 105 persons in 21 families, 4 quarts of skim milk, and 1 quart of cream daily. No sweet milk was sold, but there was a weekly sale of 80 quarts of butter milk. Of those supplied from this dairy, 1 had enteric fever.

It appears, therefore, that Mr. X supplied to the daily market of Possilpark, 56 quarts of sweet milk, 48 quarts of skim milk, and 12 quarts of cream; and that from the 9th of April till the end of May, 75 persons who were associated with this milk supply were attacked with enteric fever.

This exhausts the dairies supplied, in whole or in part, by Mr. X, and I beg now to direct your attention to those dairies which had no connection with Mr. X.

Dairy 1 received 104 quarts daily of sweet milk, and 64 quarts weekly of butter milk, and disposed of the same to 578 persons in 122 families. Associated with the milk supply of this dairy there were 2 cases of enteric fever in 2 families.

Dairy 2 received 88 quarts of sweet milk, 104 quarts of skim milk, and 18 quarts of cream daily; and disposed of the same to 1,087 persons in 225 families. No butter milk was sold. In association with this dairy there were 4 cases of enteric fever in 4 families.

Dairy 3 received 20 quarts sweet milk, 32 quarts skim milk, 6 quarts of cream, and 20 quarts of butter milk daily; and disposed of the same to 280 persons in 57 families. There were no cases of enteric fever associated with this dairy.

Dairy 4 received 4 quarts of sweet milk, 4 quarts of skim milk, 1 quart of cream, and 18 quarts of butter milk daily; disposing of the same to 74 persons in 17 families. Associated with this dairy there were 3 cases of enteric fever in 2 families, and 1 death.

Dairy 5 received 6 quarts of sweet milk, 10 quarts of skim milk, 1 quart of cream, and 12 quarts of butter milk daily;

disposing of the same among 33 persons in 6 families. Associated with this dairy there were no cases of enteric fever.

Dairy 6 disposed of the produce of 2 or more cows among 81 persons in 12 families. No cases of enteric fever.

Cart disposed of 60 quarts of sweet milk, 60 quarts of skim milk, and 14 quarts of cream, among 678 persons in 132 families. No cases of enteric fever.

Other minor sources supplied 84 persons in 16 families, with 2 associated cases of enteric fever.

241 persons in 43 families received their milk supply from more than one dairy enumerated in the two classes under consideration, with 6 associated cases of enteric fever and 2 deaths.

It appears, therefore, that 282 quarts of sweet milk, 210 quarts of skim milk, and 40 quarts of cream were supplied daily to the inhabitants of Possilpark through milk dealers not connected with Mr. X; the associated cases of enteric fever being 17, as compared with 75 cases among the 8X dairies. We have, on the one hand, an issue of 94 quarts of sweet milk, 64 quarts of skim milk, and 14 quarts of cream daily, with 75 associated cases of enteric fever; and, on the other hand, an issue of 282 quarts of sweet milk, 210 quarts of skim milk, and 40 of cream, with 17 associated cases of enteric fever, the milk supply in 6 of these cases having been from various sources.

The evidence, thus far, is very strongly on the side of a contaminated milk supply through that sent into the market by Mr. X; and it appeared to me that the 17 cases looked so much like exceptional cases which might be explained that I have carefully examined each.*

There are two cases associated with dairy 1, which is solely supplied with milk from cows kept in a byre near the dairy. One of the cases was that of a child, 3 years of age, which had an illness on the 24th of April, said to be a very slight fever, which lasted for a week. On communicating with the medical gentleman in attendance, I received a note in reply, stating that he did not think that the case was one of enteric fever. The second case was that of a child, 5 years of age; and, although mild, was a well marked case of enteric fever. The family consists of the two parents, and four children aged respectively 15, 13, 11, and 5. The milk was sent for morning and evening

* The previous results were ascertained by enumerators, who were instructed to note such information regarding cases of enteric fever as was supplied by the heads of the families.

in this case, probably by one of the younger children. The date of illness was 12th April, so that it could not have been a secondary case. Immediately opposite this house there is an X dairy; and to reach Dairy 1 it is necessary to pass two other X dairies.

With Dairy 2 there are 4 associated cases. One case occurred on the 17th April, in the person of an adult. The household consisted of 8; and one of the parents had fever. The milk was sent for morning and evening, and was used chiefly by the children, 3d. worth being got daily. A second case occurred in the person of a lodger in a family which had its supply from dairy 2; but I ascertained that he was in the habit of getting milk in dairies after walking, and especially in dairy X7. The third case occurred on the 24th April. In two houses, on the same stair, there had been 2 cases of enteric fever, one in the house below on the 15th April, and one in a house on the same landing on the 14th April; so that there is obviously room here for explanation on the hypothesis of secondary infection. The fourth case associated with this dairy occurred on the 11th of May, and was clearly a case of secondary infection, as will be hereafter shown.

With Dairy 4 there were 3 cases associated. Two of these cases occurred in one family, and both were removed to Belvidere, where the mother died. The information as to their milk supply was got from a neighbour. The date of illness was 28th April, and they were said to be wretchedly poor. Their house was immediately opposite an X dairy. The other case in connection with this dairy occurred on the 10th April, and must have been a primary case. The child attacked was the youngest of a family of four; and the original information given was that "the milk was sent for as often as required, sometimes four times a day." The house was in the immediate vicinity of Dairy 4, but was not far from an X dairy.

Of the two remaining cases one occurred at Keppoch Row on the 30th April, and one at a farm house in the neighbourhood of Possilpark, on the 28th April.

Of the 6 remaining cases, within Possilpark proper, one family, in which 3 cases occurred, described their milk supply as from a cart and other places. The date of illness was 18th April. The 3 patients were removed to Belvidere. The nearest milk supply was an X dairy in the immediate neighbourhood. In another family, in which three cases and two deaths occurred, the first case of illness occurred on the 17th April, and must have been a primary case. The milk supply was

also stated as various. The house was immediately opposite an X dairy.

An analysis, therefore, of the 17 cases of fever, not connected with the X dairies, shows that 1 of the cases was not a case of true enteric fever; that in 2 of the cases the information as to the milk supply was given by neighbours, the house being in close proximity to an X dairy; that in 6 cases in which the milk supply was stated as various, the nearest milk shops were X dairies; that in 1 case the patient was in the habit of getting milk occasionally from an X dairy; that in 2 cases the disease was probably due to infection from prior cases in the immediate vicinity; and that in 2 cases the origin was uncertain. Of the 3 remaining cases in which the milk supply was from unsuspected dairies, in 1 case it was necessary for the messenger to pass two X dairies; while in the remaining 2 cases the dairies from which the milk was obtained were close to the dwellings, though not far removed from X dairies.

In no house at which milk was delivered from any of the unsuspected dairies, was there a single case of enteric fever.

Before summing up as to the connection of the milk distribution with the epidemic outbreak, it will be necessary for me to refer to another important matter—viz., the dates of the attacks.

The epidemic commenced on the 9th of April with 2 cases; on the 10th, there were 9; on the 12th, 1; on the 13th, 2; on the 14th, 3; on the 15th, 7; on the 17th, 11; on the 18th, 3; on the 19th, 7; on the 20th, 8; on the 22nd, 9; on the 24th, 9; on the 26th, 3; on the 27th, 1; on the 28th, 6; on the 30th, 1; on the 1st of May, 4; on the 5th, 1; on the 6th, 1; on the 8th, 1; on the 11th, 1; on the 21st, 1; and on the 25th, 1; being 92 cases in 56 families.

The earliest cases of sickening occurred on the 9th and 10th of April. These cases indicate a period of infection dating from the 26th of March, and they could not give rise to new cases before the 23rd or 24th of April. You will observe that, during the month of May, there are 10 cases, of which 4 occurred on the 1st, and 6 at irregular intervals on to the 25th. The last 6 cases I regard as secondary cases, arising out of the original epidemic, which became extinct on the 1st of May. Secondary cases may still continue to appear for a length of time. If this theory be correct, the infecting causes, external to the district, ceased to operate about the middle of April, and before the milk supply from the infected farm was stopped on the 28th of April. The active period of infection, therefore, would

extend from the 26th of March till the 15th of April; and, from the rise and fall in the number of attacks, I would infer not a constant but an intermittent infection. The cases which occurred on the 9th and 10th clearly indicate a distinct infection on the 26th of March. There is then a break and a rise up till the 17th, indicating a second period of infection at about the beginning of April; the 14 cases on the 19th and 20th indicate a third period of infection on about the 4th or 5th of April; and the 18 cases on the 22nd and 24th April indicate an infection on the 8th of April. The next culminating point is on the 28th of April, indicating an active period of infection on the 13th. But at this date we come within the range of possible communication within the district itself.

The dates of sickening are always more or less indefinite, so that I do not place much importance on the figures as indicating five different periods of infection, but they certainly indicate an intermitting and not a constant daily infection, from March 26th till April 15th.

Of the 92 cases of enteric fever, 86 were evidently connected with the X dairies; and what I have previously mentioned regarding the remaining six will show that two of these cases were, in all probability, secondary. I would here observe that several of the 86 cases may have also been secondary cases, and that the last six were almost certainly so. I would even admit the possibility of all the cases which occurred after the 26th of April, 18 in number, having been secondary; but we would still have to solve the question as to the origin of the remaining 74 cases. Had I to do with these 74 cases only, scarcely an element of doubt would be left.

I apprehend that it is not necessary for me to attempt to prove that a contaminated milk supply may give rise to an epidemic of enteric fever; but, to facilitate a clearer conception of the epidemic under review, I may be allowed to refer to the epidemic of enteric fever at Colston, which I had the honour of investigating for you two years ago, as that epidemic is one of the most precise on record, having all the distinctive features of a scientific laboratory experiment. On the 26th of August, 1878, a bundle of clothing, which had been used by a person who died of enteric fever, was brought to a small dairy farm to be washed. Ten days after, the first symptom of sickening occurred amongst those who received their milk supply from this farm; and, on the 14th and 15th days after, the symptoms of enteric fever were fully developed, and the outbreak became general in every family supplied. Forty cases occurred in a

very small community; and it was demonstrated that, in nearly every instance in which members of a family escaped, their immunity was due to the fact that they either used butter milk, or only a small quantity of sweet milk to their tea, or none at all. Had a quantity of the infective *virus* of enteric fever been intentionally placed into this milk supply, on the date mentioned, for the purpose of scientific investigation, a more definite result could not have been obtained; and there was, in addition, what was equivalent to a blank experiment—viz., the distribution of an uncontaminated milk supply from another farm, amongst people living under precisely the same circumstances, which was not connected with a single case of enteric fever. By this outbreak we had, I repeat, an absolute demonstration that milk acts as a medium for the communication of the infective *virus* of enteric fever; that the infective *virus*, if present in soiled clothing, may gain access to milk through washing operations in a dairy farm; and that the period of incubation of enteric fever is 14 or 15 days. Concerning this there could be no doubt, as there was certainly only one act of infection.

On the 26th March the first issue of milk from the farm for the Glasgow Market took place, and it passed into the supply of Mr. X. Whether any portion of it ever reached Possilpark I am unable, positively, to state; but, as a matter of fact, the epidemic in Possilpark commenced on the 9th of April, exactly 15 days thereafter, which is the precise period for the incubation of enteric fever. The intermittent character of the outbreak may be accounted for in either of two or three ways. In the event of the milk being continuously infected at the farm, it may have been forwarded to Possilpark only at intervals; or it may only at intervals have been forwarded to Mr. X; or, what is still more probable, it may have been contaminated at intervals only, as through cleansing and washing operations. What took place on one occasion only at Colston may have taken place at the farm on three or four occasions; and had the supply not been stopped, it might, on several other occasions, have been forwarded in a contaminated condition to the Glasgow Market.

The Report goes on to refer to the origin of the epidemic in the farm house, as is more particularly investigated in Dr. Russell's report. In conclusion, the question of the number of persons attacked, as compared with the number of persons exposed to attacks, is discussed.

The following table gives in a summary form many of the facts detailed in the text.

TABLE SHOWING THE QUANTITY OF MILK ISSUED FROM THE DAIRIES OF
POSSILPARK, WITH THE SOURCE OF SUPPLY, THE NUMBER OF FAMILIES
AND PERSONS SUPPLIED, AND THE ASSOCIATED CASES OF ENTERIC
FEVER.

Designation of Dairies.	Source of Supply.	Quantity of Milk in Quarts, daily and weekly.				Number of Families	Number of Persons	Number of Fever Patients.	REMARKS.
		Sweet Skim.	Cream.	* Sour.	Daily Wkly				
X 1.	Mr. X.	2	4	1	0	24	12	52	0
X 2.	Mr. X.	6	6	2	0	60	30	143	15
X 3.	Mr. X.	10	6	1	0	12	46	222	8
X 4.	Mr. X.	4	8	1	0	0	13	59	10
X 5.	Mr. X.	10	4	3	24	0	62	329	13
X 6.	Mr. O.	14	16	2	0	0	0	38	16
X 7.	Mr. X.	8	0	0	0	0	0	190	12
X 8.	Mr. O.	24	0	0	52	0	0	30	1
	Mr. X.	16	3	60	0	80	21	105	
8 X.		94	64	14	136	176	252	1242	75
Dairy 1.	Mr. O.	104	0	0	64	122	578	2	case not true enteric fever.
Dairy 2.	Mr. O.	88	104	18	0	225	1087	4	case secondary, and not connected with milk supply.
Dairy 3.	Mr. O.	20	32	6	20	0	57	280	0
Dairy 4.	Mr. O.	4	4	1	18	0	17	74	3
Dairy 5.	Mr. O.	6	10	1	12	0	6	33	0
Cart.	Mr. O.	60	60	14	0	0	132	678	0
6 Dairies.		282	210	40	50	64	559	2730	9
Dairy 6.....	The produce of 2 cows.					12	81	0	
Various Dairies.						59	325	8	
						71	406	8	

* Sour Milk was not supplied by Mr. X.

THE METHOD OF PREPARING PARAFFIN SPLINTS.

BY WILLIAM MACEWEN,
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IN a paper published in the *Lancet* for August 31, 1878, the writer described the method of making "Paraffin Splints"—the vehicle being gauze. Since then a considerable variety of material has been experimented with, in view of providing a better and cheaper vehicle for the paraffin. Among other substances tried were straw, hay, paper (including newspapers), oakum, flannel, cotton, and cotton wool. A bunch of hay, laid out in a flat form, and tied together with string, could be made into a firm straight splint on the addition of paraffin. A *Herald* newspaper and a couple of pounds of paraffin, could be converted into a very excellent temporary splint for the leg, serviceable in an emergency. Most porous materials, or anything which can catch the paraffin in its meshes, can be made the vehicle for the paraffin splint. The more absorbent the material the better. The next quality is adaptability.

It is desirable to get a substance which can be readily adapted to the limb. The material which answers these purposes best is cotton wool. Any kind of cotton wool may do; but the unbleached, unrefined cotton, made up in pound parcels is much better than the white refined material. Each pound of the unbleached cotton consists of a single sheet or layer, having a considerable amount of coherence. This latter quality being advantageous during its manipulation and adaptation to the limb. A pound of cotton wool of this quality costs about 7½d. to 8d., and can be supplied at that rate to hospitals. The white refined cotton wool, commonly sold in druggists' shops, is dearer, and not so well adapted for the purpose. Wadding used for stuffing dresses, and which is obtainable in sheets, glazed generally on one side, would also make a good vehicle for the paraffin, if it were not for the fact that the sheets, as a rule, are too thin, and where a couple of them are applied, the glazed surfaces prevent that perfect cohesion which the splint ought to have. The "absorbent cotton wool," used by Dr. Gamgee, Birmingham, is also very serviceable, but dearer.

When about to make a splint, this pound packet of unbleached cotton wool is taken and the single sheet unfolded. The thickness of this sheet is generally sufficient for most splints of the leg and the arm; if the surgeon, however, desires to have it thicker, he can double the layer. A portion of this

sheet, of sufficient size to envelop the limb, is cut with scissors, —not torn. It is not necessary to be careful about forming the cotton wool into any particular shape, provided it is sufficient to cover the limb and slightly overlap. The adaptability of the cotton is such that it fits the various curves of the limb. The portion so cut is rolled up into a form which will enable it to be placed into the vessel containing the liquid paraffin. It is then submerged in the paraffin for a couple of minutes. As demonstrating the amount of paraffin the cotton wool will take up and the rarefaction of the cotton wool itself, it may be said that, the vessel containing the liquid paraffin may be almost full, and yet a large roll of cotton may be passed into this dish without causing the paraffin to overflow. After it is thoroughly saturated, the cotton is turned out of the vessel on to a portion of "mackintosh," which has had its surface previously oiled, in order to prevent the paraffin adhering. On this surface the sheet of cotton is unrolled. In lieu of the oiled mackintosh a piece of paper, a tray, or the polished surface of a table, provided these are well oiled, may be used. After the paraffin has cooled to such an extent as to enable the surgeon to place the back of his hand on it without inconvenience, it is ready for application to the limb. This cooling process will occupy about three or four minutes, more or less according to the thickness of the layer. During this time the surgeon may occupy himself in preparing the limb of the patient. This may be done by applying either a gauze or other roller bandage, so as to prevent the paraffin coming into direct contact with the limb; or by placing one or two strips of tin next to the limb as a guide for the cutting off of the splint. When the splint is not to be removed from the limb till the end of the treatment of the case, such as in a simple fracture, the former method may be adopted; but when the splint has to be cut off immediately after its application, such as one would prefer in a compound fracture, the latter method is the preferable. This sheet of cotton wool, saturated in the paraffin, is then applied to the limb, the surgeon seeing that the cotton overlaps; he then applies a bandage, preferably of gauze, pressing the cotton firmly. This pressure causes a greater cohesion in the splint, and also squeezes out any superabundant paraffin. The limb is then plunged into cold water, or cold water is applied externally, when the splint will become solid in a few minutes. If, however, the splint is to be removed, instead of placing it in the cold water, it is cut up the side opposite the tin strip previously introduced. This may be done by first marking a line with a sharp knife, and sub-

sequently cutting it up with dressing scissors. As soon as both sides of the splint are cut, before removal from the limb, it may be then plunged into the cold water; and after it has acquired a sufficient consistency to prevent alteration of shape, it may be removed from the limb and plunged into the water to complete the consolidation. If it should be very inconvenient to cut the splint on both sides of the limb, the splint may be cut on one side only, and then separated so far as to enable the limb to be withdrawn, the surgeon seeing that the shape of the splint is retained, and after removal from the limb, the opposite side can be cut if desired. Windows can be made in the paraffin at any part wanted. The time occupied in applying such a splint, cutting it off, and consolidating it, would probably be about ten minutes. If the surgeon, instead of wishing to consolidate the paraffin, would like for any reason to retard the cooling, he, in that case, does not apply the cold water; the paraffin then remaining from about twenty minutes to half-an-hour in a plastic condition. This latter quality is of considerable advantage under many circumstances, such as where it is necessary to put particular pressure on a spot, so as to retain the broken fragments of a bone in a particular position. In doing so, the contour of the bone may be made out through the still soft paraffin, the particular locus for the pressure can in this way be accurately ascertained, and while the finger is still holding the part, cold water can be applied so as to consolidate the splint; and so maintain the pressure on the part desired. Or, in treating talipes, according to the German method of stretching the tendons, the paraffin may be applied in its softened condition, then the foot can be turned into the desired position, and while holding it, it is plunged into the cold water until consolidation takes place.

The paraffin must have a guaranteed melting point of 130° F. It ought to be odourless, whitish, or semi-translucent. It is supplied in solid blocks, and to facilitate its melting it ought to be paired down. The paraffin shavings are placed in a vessel—preferably of tin—and this vessel is placed into another containing boiling water, liquefaction taking place in ten minutes. It is advisable not to place the paraffin on the fire, because if poured upon the fire it burns like grease. It is correct to state that a lighted match thrown into the paraffin would neither make it explode nor burn. There is no likelihood of any atmospheric temperature in this country affecting splints made of paraffin having a melting point of 130° F. Paraffin splints do not shrink or contract on the limb in the same way as starch and plaster of Paris bandages do. This at

first sight might seem strange, as every body contracts as it cools, and paraffin forms no exception to this rule. But this apparent contradiction may be explained by bearing in mind that the first part to cool is the external layer, the internal being kept warm, both by its own heat and the heat of the body, so that the cooling will take place from without inwards, and the contraction will take place towards the outer layer. As a consequence of this fact, the bandages should be applied with the firmness which it is necessary to maintain. If any doubt remains regarding the amount of pressure exercised, the surgeon will be able in a few minutes to see the result of the pressure on the extremity of the limb. The hands of the surgeon get smeared with the paraffin, but this can be easily removed by washing them in hot water. Before touching the melted paraffin, if he rubs his hands over with glycerine, the paraffin will not adhere in the same way. The india-rubber sheeting on which the layer of cotton saturated with paraffin is spread, ought also to be placed under the limb during the application of the splint, in order to catch any drops that may fall. If the paraffin is then allowed to cool it will peel off the mackintosh in scales. All scraps of paraffin ought to be collected and kept for future use. If any paraffin lodges on the clothes it can be removed when cool, in the form of scales. Any portions that may still adhere to the cloth may be got rid of in either of two ways:—by putting the article into hot water, or by placing a piece of blotsheet or brown paper on the outside and ironing it with a hot iron—the blotsheet sucking up the paraffin. When the splint has served its purpose, and is of no further use, it ought to be plunged into boiling water, and a weight placed on it so as to sink it to the bottom. The paraffin, as it melts, rises to the top and floats, while the cotton wool and any dirt which may have gathered, remain at the bottom. The water is allowed to stand till it is cold, when the paraffin may be lifted off the top, in the form of a solid cake. It is then ready for further use. If it should happen to have any odour, one or two washings with boiling water will remove it. In this way, the paraffin may be used again and again. The same paraffin has been used in my wards for the formation of three or four different splints. Not only can paraffin be used for ordinary splints, but a Sayre's jacket can be well made out of it. The saturated cotton sheet being applied to the body, so as to envelop it, the superabundant paraffin is removed by pressure of gauze bandages. The jacket is then cut up one side, cooled with cold water, removed from the body, and hooks inserted whereby it can be laced.

It can then be put on and removed at pleasure. It may be taken off at night, if that be advisable; and it permits of the performance of the ordinary ablutions, which adds greatly to the patient's comfort. In cases of compound fracture, where it was of importance to maintain the bones in absolute repose, the splints had a number of apertures made in them in such a way as to enable a watery carbolised solution to be poured through them on to the limb, the solution, along with any discharge, finding exit in apertures made in the most dependant portions of the splint. In this way the limb has been washed without interfering with the osseous union. In such cases an external gauze dressing is applied on the outside of the splint.

Paraffin, as a material for the formation of splints, possesses the following advantages—First, it is always ready for use; it may be kept for any length of time without spoiling or undergoing change, unless it is exposed to heat. Water or moisture has no effect upon it, and it is quite impervious to discharge. Second, it is easy of application, requiring no special training or dexterity; and the surgeon can have it ready in about fifteen minutes after ordering it. Third, its rate of consolidation is entirely in the hands of the surgeon. It can either be consolidated in a few minutes, or kept plastic for half-an-hour. Fourth, it can easily be cut with a pair of dresser's scissors before cooling, or with a sharp knife after it has consolidated. Fifth, the splint is light, easy, and comfortable to the patient. Sixth, it may be used repeatedly. After one splint is finished the paraffin can be melted and re-applied; so, although its primary cost is greater than plaster of Paris it is ultimately cheaper. A splint made in this way, applicable to the lower limb, would cost from one to two shillings, according to the size of the limb.

CURRENT TOPICS.

BRITISH MEDICAL ASSOCIATION—PROPOSED INVITATION TO GLASGOW.—The question of asking the British Medical Association to hold an early meeting in Glasgow was brought up informally at a recent meeting of the Faculty of Physicians and Surgeons. The desirableness of such a meeting was generally agreed on, and the venerable President of the Faculty was especially enthusiastic in desiring that it should be at the earliest possible opportunity. In view of the

meeting of the International Medical Congress in London, in 1881, it was thought that the meeting of the British Medical Association would probably be unsuccessful if held in that year; but a general opinion was expressed that, in any following year, the Association would be made very welcome.

INTERNATIONAL MEDICAL CONGRESS, 1881.—The Executive Committee made their report to the General Committee of this Congress, which met at the College of Physicians on 13th July. The officers of the Congress were proposed and nominated. The sections were agreed upon, and the treasurer, Mr. Bowman, announced that large subscriptions had already been received. It was agreed that the time of meeting of the Congress should be from the 3rd to the 9th of August, 1881. The President of the Council of the British Medical Association stated that the Council of that body had postponed their meeting to the following week. It was also announced that the Congress would meet in rooms granted for the purpose by the University of London, the Royal Society, and the other learned societies meeting in Burlington House, so that the sections will be all practically under the same roof.

Invitations to attend the Congress, and to subscribe to its funds, will be shortly issued to all legally qualified medical practitioners in the United Kingdom. Invitations to attend the meeting will be sent to the different countries of Europe, to America, the Colonies, and India. Papers may be read or discussions held in English, in French, or in German; and the volume of Transactions subsequently to be published, will contain the various communications in the language in which they were delivered or read. It is not yet settled, but there is reason to expect that the very highest patronage may be extended to this national undertaking which, it is to be hoped, will form an epoch in the medical history of our country.

REVIEWS.

A Manual and Atlas of Medical Ophthalmoscopy. By W. R. GOWERS, M.D. London: J. & A. Churchill. 1879.

WITH the ophthalmoscope the extremity of the optic nerve and its expansion, the retina, with its blood-vessels, can be seen, and the pathological changes occurring in those

structures observed during life, which had hitherto only been revealed on *post-mortem* examination. Some of those changes originate in, and are limited to the eye; others originating in the eye and extending backwards through the optic nerve may affect more or less the integrity of the parts within the cranium; and lastly, a third class, the result and evidence of morbid processes elsewhere extending to the eye either by direct propagation of the disease through the nervous or vascular system, or by irritation excited by disease in a distant part, communicated to the extremity of the optic nerve by processes not well understood at present. The exceptional liability of the optic nerve to be affected by diseases in other parts of the nervous system, and the distinctive character of the changes to be observed, these frequently afford important information as to the existence and nature of the morbid processes which have excited them.

Assuming that it is possible in all cases to distinguish those diseases of the eye which are the result of morbid processes elsewhere from those which are limited to the eye, the value of the ophthalmoscope in the hands of a competent observer will depend on the relative frequency and persistency of certain well defined and characteristic ophthalmoscopic appearances in connection with a given class of diseases of the nervous or vascular systems. For, if it can be demonstrated that in four-fifths of the cases of tumour of the brain there is engorgement of the optic nerve at some stage of the disease, then, from a clinical point of view, this fact must have important bearings on the diagnosis and prognosis in obscure diseases of the brain. If, on the other hand, engorgement of the optic nerve is found to be present in other diseases of the brain, the real significance and value of the symptom can only be duly appreciated when the common proximate cause has been satisfactorily demonstrated. The diversity of opinion which at present exists on this and kindred points renders further investigations necessary in order that the scope and limits of medical ophthalmoscopy may be accurately defined, and the discredit which the exaggerated expectations which had been raised, and the negative results often obtained have thrown on the whole subject, may be removed, and the real and acknowledged value of the information which it gives properly recognised. In this respect the medical ophthalmoscopy of Dr. Gowers must be regarded as an important contribution to the literature of the subject. For, whilst the work is primarily and essentially a complete treatise on the ophthalmoscope addressed to medical practitioners, the number of carefully reported cases, verified

by *post-mortem* examinations, adduced in support of his views, give a strong character of individuality to the work.

The work is divided into two parts. The first, devoted to the consideration of the general pathology of the fundus, executed with great care, gives in the space of 112 pages a complete and exhaustive account of what is known up to the present time of this obscure and difficult subject. On account of the low magnifying power (4 to 20 diameters), and the peculiarity of the illumination under which objects in the fundus of the eye are observed, it is impossible in most cases to obtain more than a general view of parts, many of which require the highest powers of the microscope to resolve, consequently, many of the pathological changes which occur in those tissues escape observation, unless they can be connected in some way with corresponding changes in the general aspect of the parts affected, *e.g.*, opacity, hypertrophy, atrophy, change of tint, &c. The exceptional opportunities which Dr. Gowers has had of supplementing the ophthalmoscopic appearances by *post-mortem* examination have done much to clear up some of the more obscure points. But that much remains to be done will be understood and admitted, when it is stated that a fundamental point, such as the existence of inflammation of the optic papilla (papillitis), has been questioned. The optic papilla is the most conspicuous object in the fundus, and being in direct anatomical connection with important parts at the base of the brain, it is the part most liable to be affected by intracranial disease. But if the fact has been fully admitted, the nature of the alterations there observed, and the conditions which are produced, their frequency and clinical value, are still subjects of dispute. By far the most striking of these changes is swelling or engorgement in its different forms. Dr. Gowers recognises three principal forms or varieties, founded purely on their clinical characters.

"1. Slight papillitis—including the condition described as congestion with oedema, in which the changes are so slight as to dim, but not obscure, the edges of the disc on indirect examination, although it may be invisible wholly or in part to direct examination.

"2. Moderate papillitis. Obscuration of the edge of the disc, or of the affected portion; complete, even to indirect examination; swelling moderate, commonly reddish; veins natural or large, sometimes white tissue about the vessels, close to them or extending on some distance in the disc.

"3. Intense papillitis. Great swelling; veins at first large, and arteries small; many haemorrhages; retina often involved

by direct damage or by haemorrhages. Always succeeds a slighter stage in which the evidence of strangulation may be at first little marked."

The relations of optic neuritis to encephalic disease, the mechanism by which the one acts on the other, and the indications which, from a clinical point of view, may be drawn from the presence of one or other of the forms referred to, have attracted the attention of physicians since 1860, when von Graefe first pointed out the connection between tumour of the brain and optic neuritis. Dr. Gowers, after enumerating the different theories which have been advanced—*intra-cranial pressure acting on the circulation; pressure of fluid in the sub-dural space, acting along the optic nerve sheaths; accumulation of fluid in the lymph spaces at the optic nerve entrance; irritation of intra-cranial tumour acting on the vaso-motor system; the direct propagation of inflammation along the optic nerve*—goes on to say that—

"This remarkable difference of opinion, regarding a fact so fundamental, is a striking proof that much more careful observation is needed of the conditions of origin of optic neuritis, the pathological changes which can be traced in it, and the allied conditions in which it does not arise, before an adequate theory can be framed, or any effective distinction into varieties can be made. The following considerations are intended rather to further this end than to establish any definite theory of its causation.

"The first point to be borne in mind, is that optic neuritis limited to, or at least most intense in, the optic papillæ, may occur without any obvious cranial or cerebral disease.

"The facts of medical ophthalmoscopy certainly make it difficult to connect papillitis with increase of intra-cranial pressure. On the other hand, as I have many times seen in cases of tumour with neuritis, there may be no sign of increased intra-cranial pressure during life, or after death."

Distension of the optic sheath "is certainly very frequent in cases of optic neuritis. It is not, however, as has been alleged, invariable either in cases of cerebral tumour with optic neuritis, or in conditions of increased intra-cranial pressure. It may be absent in tumour cerebri with characteristic neuritis. . . . It may be absent in tumour with internal effusion. Great distension of the lateral ventricles was caused in case 3, by a tumour near the corpora quadrigemina; there was optic neuritis, but with no distension of the sheaths. (In both these cases, however, the

neuritis was found to be 'descending.') In case 21 of old neuritis, due to a tumour occupying the whole of the third ventricle and interpeduncular space, and extending in front of the optic commissure, and causing enormous distension of the lateral ventricles, the optic sheaths carefully examined *in situ* were quite empty. They were loose, and had evidently been much distended. This case suggests that pressure at the base of the brain may even be incompatible with continued distension of the sheath. In tubercular meningitis, again, the condition to which the distension of the sheath appears to be related is not distension of the ventricles, or increased intra-cranial pressure, but increase of the sub-arachnoid fluid, and it bears to this disease certainly no relation to the occurrence of neuritis."

The general conclusion arrived at, after a careful survey of the facts, is, "That, in cases of cerebral tumour, evidence of descending neuritis may be traced much more commonly than current statements suggest; while, in cases of meningitis, the evidence of descending neuritis is almost invariable.

"That the resulting papillitis may be, and remains, slight, or may become intense, and present the appearance of mechanical congestion. The causes of this difference we do not know.

"That such mechanical congestion does not, as a rule, result from compression of the vessels in or just behind the sclerotic ring, but always, when intense, from compression by inflammatory products in the substance of the papilla. It must not be forgotten that an increase in the size of the vessels may be of reflex vaso-motor origin, as in all inflamed parts.

"That, while slow increase of intra-cranial pressure has no effect on the retinal vessels, a sudden increase hinders the escape of blood from the eye for a time, and may intensify a papillitis originating in another way.

"That distention of the sheath of the nerve alone is probably insufficient to cause papillitis, but may perhaps intensify the process otherwise set up, leading to retention or augmentation of fluid in the lymphatic spaces in the eye, fluid which may, in some cases, possess an irritative quality.

"In the cases, certainly rarer than is commonly supposed, in which no trace of descending neuritis can be detected, two possibilities may be borne in mind—(1) that the effect of a sudden increased intra-cranial pressure and of distention of the sheath together may possibly be sufficient to set up a papillitis; and (2) that a condition of irritation may be propagated down

the nerve, which cannot be recognised by the microscope, but which, reaching the papilla, may excite a papillitis."

The frequent association of neuritis with papillitis in tumour of the brain, and the occurrence of distention of the ventricles in two cases reported here, lend some support to the theory recently advanced by Parinand,* that distention of the lateral ventricles, with oedema of the brain and optic nerve, is the invariable cause of papillitis or oedema of the optic papilla, which he holds to be the initial stage in tumour of the brain as well as in acute meningitis. Dr. Gowers does not lay any stress on this complication, although he notes the frequency of meningitis in tumour of the brain, and thinks it may be a factor in the production of papillitis.

The most serious objection which has been urged against this theory, is the fact that well marked papillitis may occur and run its course without any cerebral symptoms, such as would infallibly be the case with so serious a lesion as oedema of the brain.

In the second part, on ophthalmoscopic changes in special diseases, the relations of optic neuritis to tumour of the brain; its symptoms, course, and duration are discussed with more detail.

The general results may be summed up as follows:—That in optic neuritis, consecutive to tumours of the brain, there is no relation between the size, position, and nature of the tumour and the intra-ocular affection. In the present state of our knowledge, it is impossible to say on what the occurrence of optic neuritis depends; but, where meningitis occurs as a complication, neuritis may sometimes be distinctly traced to it. Optic neuritis is essentially transient, and may run its course and pass away, leaving atrophy of the disc, or it may make its appearance only in the later stages of the disease.

"In many cases in which neuritis occurs long after the symptoms of tumour have existed, its occurrence precedes death by no long interval."

The neuritis of tumour is generally double, rarely unilateral. It may exist without affecting the visual functions, and its presence, unless looked for, may not be detected. Its course and duration appear to be influenced by the nature and progress of the morbid growth and its consequences, and probably also in syphilitic cases by the treatment.

"Significance:—The value of optic neuritis as an indication of the existence of an intra-cranial tumour is very great.

* *Annales D'oculistique.* July and August, 1879.

Tumour is the cause of the great majority of cases of neuritis due to organic disease, and not the result of toxæmia. On the other hand, neuritis is present, at some period, in at least four-fifths of the cases of tumour, and it may be the only unequivocal sign of organic intra-cranial disease."

After tumour of the brain, acute meningitis is the most frequent cause of intra-ocular inflammation, and although generally less intense than in tumour, may occasionally be so pronounced as to simulate the typical characters of the latter. Dr. Gowers' observations point to basilar meningitis, with extension of the inflammatory process to the trunk of the optic nerve as the exciting cause of the optic neuritis, and that there is no correspondence—as was assumed by Manz and Seber—between the occurrence of neuritis, the existence of increased intra-ocular pressure, and the distension of the sheath. "The latter is probably related solely to an increase of the sub-arachnoid fluid, without which even great distention of the ventricles not only does not cause dropsy of the sheath, but may even remove it."

The researches of Parinand on optic neuritis in the acute meningitis of infancy, so far support the view that hydrocephalus with distention of the sheath of the optic nerve exerts no influence in the production of neuritis; but, on the other hand, he has found distention of the lateral ventricles with or without distention of the sheath of the optic nerve invariably present in optic neuritis.

The number and variety of diseases of the vascular system in which ophthalmoscopic symptoms have been observed is considerable, but on account of the comparative independence of the intra-ocular circulation, many of them have little clinical and almost no diagnostic value. There is, however, one exception—viz., albuminuric retinitis, usually associated with, and generally the first reliable indication of granular kidney. The retinal changes, with the accompanying dimness of vision, generally correspond in time with the cardiac hypertrophy and increased arterial tension which characterise the later stages of the disease.

"The retinal disease presents certain elements which are variously combined in different cases. These are—(1) diffuse slight opacity and swelling of the retina, due to oedema of its substance; (2) white spots and patches of various size and distribution, due for the most part to degenerative processes; (3) haemorrhage; (4) inflammation of the intra-ocular end of the optic nerve; (5) the subsidence of inflammatory changes may be attended with signs of atrophy of the retina and nerve."

From a clinical point of view the degenerative form is the most important, on account of its comparative frequency and the absence of constitutional disturbance in the early stage of the disease. Unfortunately, the disease of the kidneys is too far advanced in the majority of cases when the state of the vision and the ophthalmoscopic examination reveal the true character of the disease. The early recognition of the retinal affection—which probably exists long anterior to the period when the accidental failure of the vision causes the patient to seek advice—might, in some cases, afford valuable aid in the diagnosis and treatment of an otherwise incurable disease, for now and again cases occur in which, from the ophthalmoscopic symptoms and the low specific gravity of the urine, there is reason for suspecting kidney disease, and which apparently get well under treatment.

But this would necessitate the routine use of the ophthalmoscope, the intelligent application of which is not by any means a common accomplishment.

Dr. Gowers very properly insists on the student learning to use the instrument early in his practical work at the hospital.

In a note on ophthalmoscopic micrometry, Dr. Gowers recommends a metal screen in front of the lamp, and a concave mirror in the ophthalmoscope, both for the direct and indirect method, but does not appear to take into account the magnifying power of the mirror and the distortion of the image on the screen from the necessity of using oblique pencils of light. It is a very remarkable fact that, considering the great advances which have been made in physiological optics, we are still in want of reliable measurements of the size of the optic disc and retinal vessels.

The appendix, containing a detailed account of fifty cases, with an atlas of the ophthalmoscopic appearances presented by many of them, is, as the author intended, the basis of the work. As a careful record of facts and observations, frequently confirmed by *post-mortem* examination, it will always occupy a permanent place in the literature of a subject where facts more than theories are a desideratum. The plates, although for the most part uncoloured, being autotypes of sepia drawings, are peculiarly valuable from the evident care which has been bestowed in the production of details, this method allowing, as the author mentions, of more exact rendering of details. As the plates refer to cases they give great assistance in following the descriptive part.

On the whole, we can cordially recommend this work to the profession as being thoroughly reliable. The author does not

presume that the appearances presented by the fundus are generally pathognomonic of particular diseases, yet the appearance of such a work will not only popularise the subject, but enable the enquirer to obtain, in a short compass, all that is really known in this important department of medical science.

A Note Book of Solubilities, arranged chiefly for the use of Prescribers and Dispensers. By JOHN EAGLE, Member of the Pharmaceutical Society. London: H. K. Lewis. 1880.

THIS little book of 58 pages costs half-a-crown. It deals with subjects of but little interest to many, but for those in search of the kind of information here given it must prove of great service. We have often been struck with the difficulty of procuring accurate and definite information on the solubilities of drugs, even on referring to the best handbooks.

The following extract will show the nature of the book:—

ACID, SALICYLIC.

The precipitated acid, 1 in about 600 cold water.

The crystalline acid, 1 in about 750 cold water.

1 in 3 cold rectified spirit.

1 in 2 sulphuric ether.

1 in 5 boiling turpentine.

1 in 150 glycerine at the ordinary temperature.

1 in 50 warm glycerine, remains in solution on cooling.

1 in 5 hot glycerine.

1 in 12 warm olive oil.

Its solubility in water is increased by the addition of borax, phosphate of sodium, or citrate of potassium.

On the Bile, Jaundice, and Bilious Diseases. By J. WICKHAM LEGG, Assistant Physician to St. Bartholomew's Hospital, and Lecturer on Pathological Anatomy in the Medical School. London: H. K. Lewis. 1880.

THIS portly volume, of more than 700 pages, has rather a taking title. When we remember the number of persons who, being otherwise healthy, confess to attacks of "the bile," or say that they are subject to "bilious" disorders, we feel that this book must meet a widespread want. Particularly is this likely to be felt by those who are conscious of some haziness as to what is wrong with "the bile" in such attacks. The addition of the word "jaundice" to the title adds solidity to the whole; and a glance at the pages of the book, bristling

with references to everybody who has discoursed on the subject, from Hippocrates and Galen to the latest German or American journal, is very encouraging.

A perusal of the work, however, takes away the thrill of pleasure which many must have felt on seeing the title on its back. The author turns out to be one of the new school of medical sceptics, and has the hardihood to make the following confession :—"I know that functional hepatic derangement is often talked about, and I fear that some will think it a disgraceful confession when I own my entire and complete ignorance of this pathological state" (p. 179). This may discourage one class of readers, but it may lead another class to hope for much light; and so we turn with some curiosity and anxiety to the section dealing with the third heading in the title, and we find the second last chapter, of 15 pages only, "On Bilious Diseases." Here we find the following extraordinary statement :—"I would venture to propose that the use of the name 'bilious,' as applied to diseases or disorders, be discontinued;" and in the next page he goes on to say, "I am not one of those much tempted to follow the newest fashions in medicine, or in philosophy, morals, or religion, and still less in names; but this is a case in which the retention of the old name, which comes, indeed, of a most venerable antiquity, will confuse and mislead, rather than give information" (p. 664). After this solemn declaration one cannot help wondering why the author should put on the back of his own book a word which he proposes should "be discontinued," and why he thus employs a name which, he says, "will confuse and mislead." The only hint of explanation is the concluding sentence of the same chapter—virtually the conclusion of the book—"Bilious complaints, with the public, will therefore in all likelihood hold their own; in the now fashionable jargon, 'bilious chill' is talked of, though what is meant appears equally a mystery either to the scientific or the non-scientific mind."

Passing from this chapter "On Bilious Diseases," which has a strong resemblance to the celebrated chapter "On Snakes in Ireland," we turn to the section on "Jaundice."

Here, indeed, we have something definite; and the historical and descriptive portion of this subject is very well dealt with. But it is scarcely credible that, in a large work like this, the subject is only dealt with as a *symptom*. "Jaundice is but a symptom, and in its treatment attention must be first of all paid to the causes which bring about the jaundice. . . . Thus, the treatment of jaundice resolves itself into

the treatment of the diseases causing the jaundice." This is very sound doctrine, but it seems curious to have a book of 700 pages on the bile and jaundice, and to have no account of gall stones and cancer or cirrhosis of the liver, &c.

What, then, does the book really deal with, it may be asked, if it dismisses bilious diseases as a popular name, and refrains from discussing the diseases causing jaundice? We have a series of chapters on various rare affections, and of these portions we can speak in terms of high praise:—*Icterus Epidemius*: *Icterus Gravis*, or *Acute Yellow Atrophy*: *Yellow Fever*: *Phosphorus Poisoning*: *Jaundice after Poisoning by Arsenic, Antimony, and other bodies*: *Icterus Febrilis*: *Icterus Syphiliticus*: *Icterus à Venenis*: *Icterus Gravidarum, Menstrualis, Embryonum, and Neonatorum*; and *Icterus with Congenital Defect of the Gall Ducts*. These chapters occupy more than 200 pages, and we have an elaborate bibliography of *icterus epidemius*, *acute yellow atrophy*, and *congenital defect of the gall ducts*: this extends to 15 pages, and will be found useful by those who are working on this subject.

With regard to the first portion of the book on "The Bile," the reader can scarcely fail to rise from its perusal with a feeling of dissatisfaction and distress. This, however, is scarcely the fault of the author, unless, indeed, it be alleged that the time has not come for any one to attempt to write a systematic treatise on the subject. Everything in this section on the bile is in the "most admired disorder." He says—"It is much to be regretted that the physiology of the bile is still in so unsatisfactory a state. Compared with it, the chemistry of this humour might almost be looked upon as a well worked field, although physiological chemistry has made but small progress in what may really be called knowledge" (p. 129). The quantity secreted cannot be estimated with any accuracy; "it is uncertain if the liver is a mere filter, or if it secrete the bile itself;" it is thought that "the pigments are direct derivatives of the haemoglobin of the blood corpuscles, though the evidence in favour of this has of late become weaker;" "it cannot be looked upon solely as an excrement," but "there is no evidence that it is necessary for the completion of the process of digestion in the stomach and intestines;" "the view that it acts as a sort of natural purge has little against it, but, at the same time, there is but little in its favour," &c., &c.

We have expressed our opinion freely as to the weak points of this volume; but we are equally ready to acknowledge that it may serve a useful purpose in presenting a condensed

account of numerous, diverse, and it may be, contradictory observations and experiments. These references may often be of value to those working in this obscure field of chemistry and pathology; and so this work may pave the way for a more satisfactory one hereafter. We have already indicated our admiration of the chapters on acute yellow atrophy of the liver, and the other rare diseases dealt with in detail.

REPORTS OF HOSPITAL AND PRIVATE PRACTICE.

WESTERN INFIRMARY.

REPORTS UNDER THE SUPERVISION OF DR. W. G. DUN.

FROM PROFESSOR GEORGE BUCHANAN'S WARDS.

STRUMOUS DISEASE OF ELBOW JOINT, SIMULATING MALIGNANT DISEASE.—This case is more interesting from a pathological than a clinical point of view. The patient, a boy of eleven years, suffered from what seemed to be strumous disease of the elbow joint, of six months' duration. The appearance of the part was suggestive of pulpy degeneration of the synovial membrane,—a large elastic, puffy swelling round the joint, most prominent behind and on each side. On 5th June Dr. Buchanan excised the joint. On cutting into it, instead of the semi-gelatinous purulent material usually met with in these cases, a greyish mass of uniform consistence presented itself, having very much the appearance of malignant tissue, and seemingly springing from the bones and cartilage entering into the articulation. The case, in Dr. Buchanan's experience, was altogether unique, and, judging from naked eye appearances, he felt inclined to pronounce it one of malignant disease, although he had diagnosed it a case of ordinary strumous disease of the joint.

The parts were submitted to Dr. Coats for examination, who notes:—The appearances here present matter of very great interest. The soft structures of the joint are converted into protuberant masses of a semi-gelatinous consistence and grey transparent colour. These masses are, in some places, an inch in thickness, and have greatly the appearance

of a malignant growth. The lower part of the humerus is buried in this tissue, the cartilage being partly concealed by it. The cavity for the reception of the olecranon is filled up, and all around the cartilages are encroached on by the new growth. Similar appearances are presented by the head of the ulna and, to a less extent, by that of the radius. The bones have been sawn through the humerus about an inch and a quarter from its extremity, and the radius and ulna about half an inch. At the divided ends there is no appearance of softening of the bones.

Under the microscope the appearances presented are those of the most exaggerated strumous disease. There is a matrix of granulations, and in the midst of these innumerable little rounded nodules. These have the regular structure of tubercles—large giant cells in the centres, and around them variously shaped epithelial like cells, with round cells interspersed and at the periphery. The epithelioid cells were very abundant, and presented an appearance very much like the cells of a scirrhus, and, in fact, on examination in the fresh state, these cells were floating about so freely that the impression was given that it might be cancerous. The detection of the tubercular nodules, however, makes it perfectly plain that the case is one of strumous disease, with an enormous exaggeration of the new growth. It may be added that, in Dr. Coats' experience, tubercles are always present in the gelatinous tissue of strumous joints.

ANEURISM OF INNOMINATE ARTERY—GALVANO-PUNCTURE—RUPTURE OF SAC—LIGATION OF INNOMINATE ARTERY.—T. W., aged 40, stone dresser, was admitted 19th April, 1880, with a pulsating tumour on the right side of neck, about as large as a good sized orange, situated at the inner end of the clavicle, and extending upwards in the line of the carotid artery. The tumour was very prominent, and the pulsation eccentric. The skin over it was glazed and inflamed. Severe pain was complained of in the right arm.

The tumour was first observed about the beginning of December last, and soon attained the size of a small hen's egg. It continued almost stationary till the middle of April, when it suddenly began to increase, and in a few days reached the size noted at admission. The condition at this date appearing to contra-indicate any operation, the patient was confined to bed, and iodide of potassium given in 30 grain doses thrice daily. Morphia was also administered so as to secure rest and relieve pain. No improvement can be said to have taken place under this treatment, the tumour continuing to get larger.

The propriety of trying galvano-puncture had already been considered, and at a consultation held on 12th May, this was resolved to be done. The case was not considered at all favourable for the operation, and it was only decided upon as giving the patient a last chance.

14th May.—Galvano-puncture performed to-day by Dr. McCall Anderson. Two needles, connected with both poles of the battery, were inserted into the tumour. The operation lasted an hour, four cells being employed during the first half-hour, and six during the second. On withdrawing the needle attached to the negative pole a considerable quantity of gas and frothy blood escaped from the puncture. By slight digital compression the bleeding was stopped. 5.30 P.M., blood oozing from puncture made by positive needle; perchloride of iron and compress of lint applied. The tumour, greatly increased since morning, now occupied almost the whole of right side of neck.

16th May.—No recurrence of haemorrhage. The pulsation seems less, and some consolidation appears to have taken place at the seat of the punctures.

20th May.—Tumour greatly increased in size, and skin more inflamed and glazed. Oozing this morning from needle punctures.

24th May.—Functions of larynx and trachea manifestly interfered with. The dimensions of tumour are as follows:—Circumference 22 inches, antero-posterior diameter 9 inches, vertical 5½ inches. The upper margin is about 1½ in. below lobe of ear, and the tumour extends about 2½ ins. across the middle line.

27th May.—Constant oozing of dark blood from a place where tumour threatened to point and burst. Collodion and lint applied.

1st June.—During night almost constant escape of blood from the needle punctures; sharp haemorrhage about 7 A.M., and a large clot, forming a decided projection, now seen, covered by a very thin membrane, which had given way in two places. The bleeding stopped spontaneously. Patient very weak. 9 A.M.—After consulting with some of his colleagues, Dr. Buchanan determined to open the sac and ligature the vessel from which the blood issued. Chloroform having been administered, an incision was made in the line of the carotid, and another transversely across the tumour. A gush of arterial blood followed the second incision, and several hands were immediately forced into the neck and the bleeding temporarily stopped. The clots having been rapidly turned

out the rent in the vessel was seen to be just at the bifurcation of the innominate artery into subclavian and carotid. Dr. Buchanan quickly passed his finger behind the innominate, and compressed it against the sterno-clavicular articulation, completely arresting haemorrhage. An aneurism needle was now passed behind the artery and a ligature applied. When the first rush of blood took place the patient seemed on the point of expiring, but once the haemorrhage was controlled, a slight improvement took place. The wounds were closed and dressings applied, but the patient survived the operation only a few minutes.

Remarks by Dr. Buchanan.—The operation of ligature of the innominate artery was performed after the aneurism had burst externally. The bleeding being temporarily arrested by the clot which plugged the opening in the sac. When the case was, a day or two before the end, rapidly assuming a condition which must soon prove fatal, there was some doubt in Dr. Buchanan's mind as to whether the aneurism might not have been treated in the early stages by distal ligature. But when at the operation it was seen that the rent in the artery was more than an inch long, and that half of that was in the common carotid and half in the subclavian, and the larger part of the opening in the angle of bifurcation, it was obvious that nothing short of simultaneous ligature of the subclavian in its third part, and of the common carotid high up, could have arrested the current of blood through the aneurism.

But if ever it is proposed to tie the artery after opening the sac, it should be done long before the sac has been distended to the verge of bursting.

GLASGOW ROYAL INFIRMARY.

REPORTS UNDER THE SUPERVISION OF DR. WILLIAM MUIR.

FROM DR. PERRY'S WARDS.

CASE OF ATHETOSIS. [Reported by J. Walker Downie, Resident Assistant.]—B. C., æt. 10, a school girl, was admitted into Ward IV, on 19th March of present year, suffering from spasmoid movements of the left arm, and a somewhat similar affection of the left leg. When admitted she had the appearance of having been poorly fed, being thin and ill conditioned. There is no history of any nervous affection in the family,

more than that the mother is easily excited. Both parents are of temperate habits. The child, when rather more than a year old, had measles and whooping-cough at the same time. When attacked by the measles, the rash not coming out well, she had a warm bath by order of the medical attendant. On being taken out and put to bed she took a fit,—the eyes were shut, the right eyeball being turned inwards, and there were twitchings of the muscles of the arms and legs, and the mouth was drawn, the mother thinks, to the left side. This fit was not preceded by any scream, nor was there any foaming at the mouth. She remained in this state for about an hour from the time of its being noticed. While in the fit she had a powder which purged her, and on the bowels being relieved the twitchings ceased.

Next morning, when dressing the child, her mother noticed her left hand hanging in a powerless condition at her side, with the thumb flexed into the palm of the hand. It remained in this position from the time of attack until coming into the hospital.

Shortly after the onset, a lump grew on the palm of the affected hand; this was cut out and the hand put in a splint, and kept there for a few weeks; but there are no traces of a cicatrix nor any other evidence of surgical interference.

Patient was four years of age before she attempted to walk, and when able to do so, she dragged the left foot after her. She seemed to speak with difficulty. "She had difficulty in getting the words out" up till two years ago, when her speech improved considerably. During sleep her hand twitched occasionally, and there were occasional twitchings of the left eye also when asleep.

Present condition.—The patient now is well nourished. She has a somewhat large head; her face suggests want of intelligence; her eyes are large, staring, and of a light blue colour; her upper lip projects, her mouth is always more or less open, and her teeth are somewhat peg shaped,

The left arm is usually in a semi-flexed position across the breast, and supported by the right. In this position the hand is flexed on the forearm; but when directed to extend the arm, the hand is then extended, and has an appearance very similar to that of a bird's foot, the first phalanx of each finger being in normal position, the second over-extended, and the third normal, thus presenting a curve similar to that seen in the phalanges of a bird.

If the patient is sitting, and her attention withdrawn from the arm, the hand lies in the supine position with the thumb

adducted, perfectly still, and the same is the case while she is asleep. Occasionally, however, when in this position, there are movements of extension and flexion of the forefinger, the hand and arm remaining at rest.

When directed to take hold of any object placed before her, her arm is lifted somewhat stiffly out from her side, and then her whole side sweeps round with the arm, the position of the hand being then between pronation and supination. The first, middle, and ring fingers are extended and parallel to each other, while the thumb and little finger are widely separated from them. There are no twitchings of any part until the object is reached, when there ensues a series of tremors of the whole arm, but more especially of the forearm, seemingly from an attempt to pronate the hand, which she is unable to do. These tremulous movements are accompanied by peculiar movements of the fingers, the first, second, and third remaining extended, while the object is grasped between these on one side, and the thumb and forefinger on the other, these latter being adducted, and the fourth at the same time somewhat flexed. When the object is grasped the spasms continue, and generally it is let fall involuntarily, after being held for a variable time—from a few seconds to several minutes. At the time of admission, once having grasped an object, she was unable to release her hold without the aid of her other hand. She does not grasp so firmly now as she did previously.

The muscles of the forearm have all along been hard and firm.

When walking, the left leg is slightly dragged, and the foot drawn inwards, the toes being spasmically alternately flexed and extended.

Treatment.—On the day after admission (20th March) treatment was begun by giving the following mixture:—

R.	Liq. Arsen. Hydrochlor.	9 ij.
	Tinct. Ferri. Mur.	3 iss.
	Glycerine,	3 j.
	Aquam, ad.	3vij. m.
Sig.	A tablespoonful three times a day.	

On the 25th of the same month, a course of galvanism was commenced, the strength of the current (continuous) being 5 cells of a Leclanché Medical Battery.

The above treatment has been continued since with considerable benefit, but this might be due in great measure to the better and regular dieting of the child.

The muscles of the forearm still remaining hard and firm, on

the 17th of June, in addition to the above treatment, she had her hand and arm fixed in a rectangular splint, the object being to keep the limb thoroughly at rest. In a very few days the muscles became lax, and almost an opposite condition, as regards the action of the muscles of the hand, ensued.

Previously the difficulty was in relaxing the hold of an object after grasping it; now she has great difficulty in grasping an object; she strikes it with the palm of her hand, but cannot clutch it for some time, and after once getting hold of it she can relieve her hold with comparative ease.

FROM DR. MORTON'S WARDS.

CASE I. SPINDLE-CELLED SARCOMA OF MALE BREAST.—D. M'L., aet. 37, labourer, a strong, healthy looking man, was admitted into hospital on 14th July, 1880, under Dr. Morton's care, with a large ulcerated and fungating tumour of right breast, of seven years' duration. The tumour, on admission, was 22 inches in circumference, hard, lobulated, encapsuled, and moving more or less freely on subjacent tissues, with great and fetid discharge from surface. Although of such long duration, there was no glandular affection, and the patient's health had suffered comparatively little; and from the first the tumour has been absolutely painless. Seven years ago patient received a blow on the breast from a heavy piece of iron, causing a wound which the patient describes as a *hash*. He paid little attention to it at the time, but from the irritation of sweat and a woollen semmet, it *cankered*, and ultimately a lump formed which made very little progress till he received a second blow on the same spot. After that he had several blows at different intervals, with the effect of a more rapid increase of growth after each injury.

Patient had a maternal aunt who was the subject of a malignant tumour of breast, which was twice removed, and as often recurred, and ultimately caused her death. In other respects his family history is good.

On 17th July Dr. Morton removed the breast, making at the same time a parallel incision in the axillary line to allow the edges to be as closely approximated as possible.

After removal the tumour weighed about 2 lbs. Dr. Foulis made a microscopic examination, and pronounced the tumour to be a spindle-celled sarcoma. Patient is doing well; temperature normal at present date.

CASE II. TRAUMATIC TETANUS TREATED BY CALABAR BEAN—RECOVERY. [Précis of Report by T. William Hughes, L.F.P.S.G., &c.]—G. B., a little boy, æt. 5, was admitted into the hospital, under the care of Dr. Morton on 19th June, 1880, with very severe lacerated and contused wound of plantar and lateral aspects of the left foot, caused by being run over by a tramway car. Dr. Morton, on seeing the case, removed part of the *os calcis*, stitched the parts together, and dressed with camphorated oil. On dressing two days afterwards, the foot was found to be sloughing and stinking, and deodorant poultices were applied; but, as the temperature was rising and the patient getting worse, Dr. Morton decided to amputate a little above the ankle, which he did on the 26th, and ordered brandy and quinine to be given. The temperature fell after the operation, and the patient was apparently doing well till the 3rd of July, when trismus set in, when he was ordered $\frac{1}{2}$ grn. of the Ext. of Calabar Bean every hour, with brandy and beef tea at intervals in the course of the day. At 7 P.M. on this date, he had his first severe spasm, and later in the evening marked opisthotonus set in. He slept well during the night, but next day he had severe twitchings, and screamed a great deal; but the wound looked well, and the temperature was just about one degree above normal. His jaws were firmly locked, and it was with difficulty that egg-flip and iced milk could be given. He had specially severe spasms about 7 P.M. each night till the 6th, on which day the dose of the bean was increased to $\frac{1}{6}$ grn., when the spasms abated. On the 8th, however, the patient became worse, and at 1 P.M. opisthotonus again set in, and he was nearly suffocated from his tongue having caught between his teeth. The dose of the bean was increased to $\frac{1}{4}$ grn., and, latterly, nearly $\frac{1}{2}$, when he began to improve, and his temperature fell to normal. He can now (16th) open his mouth and take his porridge. His stump is doing well, he sleeps excellently, and his temperature is normal; but he is still continuing the bean.

MEETINGS OF SOCIETIES.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.

SESSION 1879-80.

MEETING X.—16TH APRIL, 1880.

DR. FERGUS, *President, in the Chair.*

DR. MACLEOD read on HYPERSTROPHY OF THE PROSTATE IN OLD PERSONS, AND ITS TREATMENT. (See July Number, p. 1.)

Dr. Hugh Thomson strongly recommended Charrière's catheter, which he exhibited. It was perfectly pliable, certain to recover its shape, and easily went past any obstruction at the prostate. It required no special manipulative skill. He had never seen a case in which it had failed. It could not be forced through the prostate. It was remarkable that an instrument with all these good qualities could not be purchased in this country, even in London, but had to be got direct from Paris.

Mr. John Reid said that, when he was in country practice, he had a great many cases of chronic enlargement of the prostate, and they were very annoying. They generally occurred in persons who lived freely. A certain amount of inflammatory action was set up, followed by congestion. There was a superabundance of lithates in the urine. Relaxing treatment had generally good effect in diminishing the congestion. He now never used metallic catheters, preferring the gum elastic instrument without the stilette. The bulbous pointed catheter was superior to the ordinary instrument, and would be got through when the other would be caught in the narrow part. In country practice, when he did not happen to have a catheter with him, a good dose of 8 or 10 grains of calomel was often prescribed with effect. Medical treatment was often interfered with from the practitioner's inability to resist the importunities of the patient to use an instrument.

The President remarked that he had seen a great deal of mischief done by unskilful interference in cases of enlarged prostate. This had led him to the conviction that none but a skilful surgeon should treat them. Dr. Macleod's paper was one of great practical value.

Dr. Macleod said that it was of great advantage to apply

cold in these cases, by means of injecting into the bowel ice-cold water. In regard to puncture of the bladder above the pubes, the aspirator was a perfectly safe instrument. The operation was not very painful, and chloroform was not required. The advantage of it was that it left the neck of the bladder at rest, so as to have time to recover.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.

SESSION 1879-80.

MEETING VII.—9th MARCH, 1880.

DR. HECTOR CAMERON, *Vice-President, in the Chair.*

DR. MC CALL ANDERSON showed THE ORGANS FROM A FATAL CASE OF ACUTE PHTHISIS. The disease occurred in a girl aged 19, and was very rapid in its course. She died four days after admission to hospital, and two notable features in the case were the rapidity of the pulse—160 per minute; and of the respiration, 60.

DR. FOULIS showed THE LUNG AND LARYNX FROM DR. MC CALL ANDERSON'S CASE. The *post-mortem* examination showed that there was no emaciation of the body. On opening the chest, the left pleural cavity was found occupied partly by air and partly by turbid serum (about 15 oz.) There were a few old adhesions near the left apex. The left lung was quite compressed, and flattened against the spine. An attempt was made to detect a possible rupture in the lung tissue, by filling up the chest with water and inflating from the trachea, but without success. On laying the lung open it was seen to be studded with numerous miliary tubercles in groups and single. At the lower and anterior part of the lung was a small pus-filled cavity about the size of a plum, and near it several minute cavities. In the vicinity of these cavities the tubercles were softer than elsewhere. In the right lung the tissue was bright red, crepitant, and free from tubercles, except at one or two spots. On the posterior wall of the larynx was a slightly eroded patch, with an apparent infiltration of the mucous glands near it. No tubercles were seen in any other organ.

DR. CLARK showed A SPECIMEN OF DISEASE OF THE SPINE

WITHOUT CURVATURE. The second and third dorsal vertebræ were eroded, and the discs had disappeared. No curvature had taken place, as a splint of new bone had been applied on either side of the bodies. On the left side the rib articulated with the pillar on the same side, and was not ankylosed. On the right side, ankylosis had taken place.

DR. FOULIS showed THE SPINE OF A MIDDLE AGED MAN (to compare with Dr. Clark's case), in whom a gradually increasing paraplegia had set in four weeks before death. The body of the sixth dorsal vertebra was found completely eroded and destroyed, and a collection of thick pus surrounded it. There was no curvature or deformity, although the pus had made its way into the spinal canal, and so compressed the spinal cord. It was not uncommon for disease of the spine to exist, even in an advanced degree, without curvature.

DR. FOULIS showed his method of POST-MORTEM EXAMINATION OF THE MIDDLE EAR. He had used it during the last thirteen months. Before describing it, he wished it to be very distinctly understood that he in no way proposed it as a substitute for the methods of Toynbee, v. Troeltsch, or Lucas, &c., but only as a means to be used in those cases where, from want of time, or permission by friends, or other causes, the ear could not be minutely dissected. As a matter of fact the ear was neglected at *post-mortem* examinations; and it was to give a ready and rapid means of opening the middle ear that he brought the subject up. If with a chisel the petrous bone is split along a line parallel to the squamous plate and falling on the outer slope of the eminence caused by the superior semi-circular canal, the tympanum will be split open, together with the mastoid cells. As a rule, the stapes is separated from the incus, and a good view is obtained of the parts in the tympanum, and also of the state of the mastoid cells: and if the cochlea or semi-circular canals require further examination, the loose bit of the petrous bone may be taken up and again split in various directions, or examined more minutely in the way laid down in books. Of course, the plan proposed gave only large sections of the ear, and could not be regarded as applicable to those cases where a previous history of ear disease and other circumstances indicated the need for a minute examination: but for the ordinary run of *post-mortem* work it gave accurate enough results. Dr. Foulis had examined the ears of 112 cadavres, and in 17 of these (about 1 in 7), there was distinct disease, suppuration, or destruction of the *membrana tympani*, or other coarser lesions.

In reply to Dr. Barr, Dr. Foulis pointed out that the method

here given was not that of v. Troeltsch, who advises the removal of the petrous portion with the tympanum intact, and a careful examination afterwards. In ordinary practice, such a course would be too tedious for any pathologist to follow in every case of *post-mortem* examination: and thus many cases of ear disease would escape notice.

THE SECRETARY showed, for DR. M'PHAIL, A PREPARATION FROM A CAST OF TALIPES EQUINUS. It was the foot of a gentleman, aged 40 or so, which had to be amputated in consequence of continual pain and annoyance from ulceration on the toes, and the formation and inflammation of numerous adventitious bursæ, which had for some time prevented him from walking about. The case was one of talipes equinus, with a very slight degree of varus, and he had slight talipes varus of the other foot. Both deformities were congenital, and no attempt to remedy them had previously been made.

The cast shows the extreme bending across the instep, often supposed to be characteristic of acquired, as compared with congenital forms of this deformity, and this is rendered more striking by the presence of a small, prominent swelling, exactly similar to that set down to projection of the astragalus in many of the acquired cases described, but in this case consisting of an old bursa, evidently partly consolidated by inflammation.

The bones are remarkably light and contained much oil. In the skeleton the essential feature of the deformity is seen to be a twisting downwards and slightly inwards of the anterior portion of the os calcis and astragalus, the rest of the bones taking their abnormal position from these. There is very little, if any, drawing up of the os calcis behind the ankle.

It is evident, from inspection of these bones, that the essential part of an operation on such a foot as this would be division of the tissues in the sole of the foot, and that division of the tendo achillis would be almost unnecessary.

DR. MACEWEN showed the LOWER END OF THE FEMUR FROM A CASE IN WHICH OSTEOTOMY HAD BEEN PERFORMED. The case was that of a boy, aged 7, with knock knee. Six or seven days after the operation he had slight sore throat, which soon developed into distinct diphtheria, which spread rapidly, with a very high temperature. The wound in the leg never showed the slightest signs of disturbance, and healed. Death took place on the ninth day. The specimen showed that the line of incision did not encroach on the knee joint.

MR. HENRY E. CLARK gave a SUMMARY OF HIS OBSERVATIONS AS TO THE NORMAL LENGTH OF THE CONDYLES OF THE

FEMUR. He stated that he had been led to undertake the investigation because of the difficulty experienced by surgeons in ascertaining if any given case of knock knee was due to elongation of the internal condyle of the femur, in consequence of there being no recorded normal measurements, and no definite statement as to the average difference in the length of the two condyles. In measuring the internal condyle he took as his upper limit the spine for the insertion of the adductor magnus, and for his lower the margin of the articular surface at the extremity of the bone; the external condyle was in like manner measured from the prominence immediately above the popliteal groove to the articular margin. The measurements were taken with small calipers, and recorded in millimetres. He had measured 100 femurs taken at random from the collections in the University and Royal Infirmary Anatomical Museums; the longest of these was 550 and the shortest 383 millimetres, the average length being 444. The average length of the external condyle was 35.84 mm., and of the internal 43.59 mm., showing an average difference of 7.75 mm., or, stated roughly, a quarter of an inch. In no instance was the external longer than the internal condyle.

M E D I C A L I T E M S.

UNDER THE DIRECTION OF

ALEX. NAPIER, M.D.

Litholapaxy.—Dr. Edward L. Keyes describes this operation in the *Annals of Brooklyn Med. and Surg. Soc.*, June, 1880. It consists simply in lithotripsy, with rapid removal of the fragments. The mortality in 120 collated cases was six, exactly 5 per cent. The time which the operation may be allowed to occupy may almost be disregarded as an element worthy of much consideration; Bigelow's rule is, that "rapid lithotripsy should be done slowly;" the operation, however, should be completed as quickly as is consistent with gentleness of manipulation. The conclusions to which Dr. Keyes' experience in litholapaxy have led him are these:—

1. Litholapaxy is applicable to all stones in the adult capable of being broken by an instrument which can pass the

urethra, multiple stone is rather an advantage than otherwise where there is much calculous matter.

2. Stricture does not contra-indicate the operation. If near the meatus it may be cut at the time of crushing the stone. If deeper, it should be cut or stretched by preparatory treatment.

3. Prostatic hypertrophy is no bar to the operation so long as solid instruments of reasonable size can be made to enter the bladder without the use of force.

4. Age is no bar to the operation.

5. Inflammatory conditions of the bladder do not contra-indicate the operation, although, undoubtedly, a reasonably healthy bladder furnishes a better field.

6. Chronic Bright's disease, heart disease, and general debility do not so seriously contra-indicate this operation as they do others upon the urinary tract, and may be almost disregarded, unless so far advanced as to make any other surgical manoeuvre upon another part of the body undesirable. Pre-existing pyelitis is the gravest complication which can (immediately) compromise the success of the operation.

7. The operation should not be undertaken without a large previous experience upon the dead body or a small experience upon the living subject with old-fashioned slow lithotripsy without ether.

8. A lithrotite which cannot be made to clog, which will not readily catch the bladder, and is as small as will satisfy the requirements of the stone as to size and hardness, is desirable. The tubes may be straight or curved as large as the urethra will admit comfortably after cutting the meatus if necessary, and any efficient washing bottle can be used which may suit the operator's fancy, if it be a bottle which will not allow air, which may have accidentally entered the bladder, to remain there.

9. A surgeon should not undertake the operation unless he feels that he can recognise the fact at once if he catches the bladder, so that he may drop the fold of mucous membrane immediately without bruising it.

Method of Masking the Odour of Iodoform.—Dr. Lindemann, of Münster (*Schweiz. Correspbl.* 20, 1879), finds that balsam of Peru completely hides the smell of iodoform. He mixes two parts of the balsam with one of iodoform, and recommends vaseline as being the best medium for an unguent; it may also be employed in an aqueous solution.

The following are useful formulæ:—

R. Iodoform, . . . 1 gram.	R. Iodoform, . . . 1 gram.
Bals. Peruv., 2 gram.	Bals. Peruv., 3 gram.
Vaseline, . . 8 gram. m	Spt. Vin. Rect. or Glycerine, 12 gram. m

In both of these preparations the iodoform should first be mixed with the balsam; the vehicle should afterwards be added.—*The Practitioner*. July, 1880.

Perfectly Bloodless Operation.—The “bloodless” method of operating, recommended some years ago by Esmarch, is opposed by many surgeons on account of the general oozing which is apt to occur after removal of the elastic tube. Esmarch describes here (*Verhandl. d. Deutschen Geselsch. f. Chirurg. Apl. 1880*) the latest practical modification of his mode of procedure, by means of which such oozing may be completely prevented. In amputations, the operation is performed in the usual way by the bloodless method; all vessels requiring ligature are then carefully sought out and tied, and the wound at once closed with catgut sutures; drainage tubes, capable of being absorbed, are introduced, and Neuber’s permanent compressing dressing applied. Then, and not till then, is the elastic tube removed from the limb. After the patient is placed in bed, he should keep the stump up in the vertical position for at least half an hour. [Neuber’s permanent dressing consists of an antiseptic cushion, four-cornered, made of carbolised gauze filled equally and smoothly with carbolised jute; this cushion is applied directly to the wound, and is kept firmly in place by an elastic bandage which overlaps the dressing.] Of twelve amputations (9 of the leg) performed and treated in this way, secondary haemorrhage occurred in none; in most of them the first dressing was not removed for 14 days, and on it was then found only a narrow, dry streak of blood, corresponding to the linear cicatrix. In resection the author advises that after all visible ends of vessels have been tied, the wound should be closed with the continuous glover’s suture, and that the limb should then be made fast to a splint and kept elevated for at least half an hour. In 56 resections managed in this way since 1878, neither secondary haemorrhage nor death had occurred. Since Easter, 1879, the author had also, in his operations for diseased bone, given up the practice of plugging the cavity from which the sequestrum had been removed; instead of this he now carefully disinfects the cavity, introduces absorbable drainage

tubes, closes the wound in the skin at once, and applies the permanent dressing; the last step in the proceeding is, as before, the removal of the elastic tube. Twelve cases were treated in this fashion, and in none of them did secondary haemorrhage occur; in all of them the wound remained aseptic, and in several instances complete primary union took place. Esmarch also states that he has frequently adopted, and with similar results, the same method in various other operations on the extremities, such as the removal of tumours from these parts; in the neighbourhood of the shoulder and hip-joints, however, it is a matter of much greater difficulty to carry out the above directions, and so to obtain a perfectly bloodless operation.

The Use of Oxalate of Cerium for the Relief of Cough.—The following are the conclusions arrived at by a committee of the Therapeutical Society of New York, appointed to consider the value of oxalate of cerium for the alleviation of cough. The report is based on the observation of 84 cases.

1. Cerium oxalate may be given safely, in doses of 10 grains or more, three times a day, for many days in succession.
2. The only symptom noted from such doses is a slight dryness of the mouth for the first few days.
3. It is probably more efficient when taken dry upon the tongue.
4. Its effects are not fully apparent until it has been taken two or three days, and they continue about the same length of time after its use is suspended.
5. For chronic cough it is best taken on an empty stomach, early in the morning and at bedtime, with other doses during the day if required, the initial dose for an adult being 5 grains.
6. It is, in a majority of cases, an efficient cough medicine, at least for a considerable time, and is very valuable as an alternative with other drugs used for that purpose.
7. It does not disturb the stomach, as do opiates and most other cough remedies; but, on the contrary, it tends to relieve nausea, and to improve digestion.
8. The different preparations in the market are not of equal value, and when success is not obtained with one, another should be substituted.—*New York Medical Journal.* July, 1880.

New Formula for Fehling's Solution.—The ordinary Fehling's solution shows a great tendency to chemical decom-

position after standing a short time. To obviate this tendency, Schreiter, of Wittembourg, uses a solution of the following composition :—

Salicylate of Soda,	.	.	1 gramme.
Sulphate of Copper,	.	.	1 gramme.
Caustic Soda,	.	.	5 grammes.
Distilled Water,	.	.	20 grammes.

After filtration, this fluid has a clear blue colour. On heating in a test tube, the cupric salt undergoes alteration, the presence of the least trace of sugar being indicated by a deep brownish-red coloration. The author states that this solution keeps well.—(*Pharm. Zeitung.*) *Bull. Gén. de Therap.* 30th June, 1880.

Drinking Water on the Continent.—A communication, which we have received from a traveller, describes a severe outbreak of typhoid fever in Switzerland, to be traced, it is stated, as most of such outbreaks are traced, to impure drinking water. Sir Henry Thompson, adverting to this abundant source of danger to travellers, recently recommended that every traveller should carry with him a filter and a teapot, by way of practically abolishing, by personal care, some of the danger of impure water by securing that it should be very thoroughly boiled before being used. Dr. Hermann Weber, whose experience of foreign resorts is perhaps greater than that of any other English authority, has published a similar warning to travellers, and has recommended them to use Apollinaris water whenever it is to be obtained, as an undeniably pure drinking water, which would secure them from these dangers; and he has stated that he has known, in more than one instance, when members of the same travelling party have been careful to adopt this precaution, while others have neglected it, that those who adopted such precautions have been saved from typhoid fever, which attacked other members of the party. In the meanwhile, some such precaution for obtaining drinking water of absolute and guaranteed purity must recommend itself as a necessary means of safety. Recent analysis by chemical authorities, of which some of the results are before us, have shown that the water contained in the siphons, which are introduced at foreign restaurants, is not more reliable than the ordinary water supply; indeed, a table before us, to which, perhaps, we shall subsequently have to refer, indicates that, in one great foreign city at least, the water in the siphons is very much more impure than even the ordinary

city drinking water, being in some cases little better than diluted sewage water. It appears that the manufacturers of these aerated waters in foreign siphons are by no means very careful from what kind of surface wells they draw their supply, or how they purify their water; and, on the whole, the danger of drinking the aerated water of siphons is, unless the quality be definitely ascertained, greater even than that of drinking the ordinary impure water. It is quite time that foreign authorities should turn more serious attention to this subject.—*British Medical Journal.*

Clinical Detection and Estimation of Albumen in the Urine.—Dr. Esbach prefers picric acid as a re-agent for the detection of albumen. His test fluid is made by dissolving, in 600 or 800 grammes of water, 10 grammes of picric acid, and 20 grammes of pure citric acid simply dried in the air; after solution, water should be added to make a litre. Albumen will be detected by placing a little of the fluid in the test tube, and adding the filtered urine drop by drop. If at the point of contact a cloud *instantly* appears, the presence of albumen is demonstrated. If the urine be concentrated, and the cloud very light and not instantaneous in appearing, the precipitation of uric acid might be suspected; the precaution should therefore be taken of warming the liquid before adding the urine. The estimation of the quantity of albumen present is accomplished by using Dr. Esbach's *Albuminimètre*, which is simply a test tube of fixed size and diameter, accurately graduated and marked. This tube is filled with the urine up to the line marked U, which is near the middle of the tube; the test solution is then added till the level of the fluid reaches the line marked R, near the top of the tube. The mouth of the tube should then be closed with the thumb, and the whole inverted several times, to mix the contents thoroughly; but this should be done without violent shaking. Finally, a firm stopper of caoutchouc is then introduced, and the mixture allowed to stand about twenty-four hours. At the end of that time the height of the *centre* of the layer of coagulum may be read off on the scale with which the tube is furnished near its bottom. The graduation represents, in grammes, the quantity of albumen contained in a litre of the urine experimented with. The urine should be distinctly acid. Should its reaction be doubtful, a few drops of acetic acid must be added. The lower the numbers given, the more exact the estimate; if the urine is very albuminous, therefore, it should be diluted with one or

two volumes of water, this dilution, of course, being borne in mind in stating the result. This method is specially adapted for estimating albumen in cases of renal or cardiac disease, but is not so well suited for testing the slight and transient albuminuria of typhoid fever. The above proceeding is accurate enough for clinical purposes. A method by which absolute precision is attained is described by Dr. Esbach in the *Bull. de Thérap.*, 15th January, 1880. In this case the test solution employed is the following:—Warm water, 1 litre; picric acid, 10 grammes; after dissolving and cooling, add 20 cubic centimètres of crystallisable acetic acid.—*Bull. Gén. de Thérap.* 15th June, 1880.

A New Preservative Fluid.—Mr. Wickeisheimer, of the University of Berlin, has invented a fluid for the preparation of animal and vegetable tissues, which surpasses anything hitherto known in its power of preserving the colour, form, and elasticity of specimens treated with it. The fluid is either injected into the veins of the body to be preserved, or the entire object is immersed in it. After being taken out of the fluid and dried, the elasticity of the tissue and flexibility of the joints are secured. In skeletons thus prepared the most complicated movements can be executed, such as those of the chest, larynx, and other parts concerned in the mechanism of breathing. Lungs thus prepared may, even after years, be inflated by means of bellows; they swell to ten times their size in the collapsed state, the lobes become distinct, the brown colour changes gradually into red, and the whole organ appears as if taken from a fresh body. Sections of delicate tissues, morbid formations which have been removed by operation, will appear after months as if in a fresh state. The Prussian Government have purchased this valuable discovery, and the Minister of Instruction has published it in his official organ for the benefit of the scientific world. The formula for the preparation of the fluid is as follows:—In 3,000 grammes of boiling water, dissolve alum 100 grammes, common salt 25 grammes, saltpetre 12 grammes, carbonate of potash 60 grammes, arsenious acid 10 grammes. After cooling and filtering, add to every 10 litres of the solution 4 litres of glycerine and 1 litre of methyl alcohol. The method of application differs according to the nature of the objects to be preserved. Anatomical preparations that are to be preserved dry are immersed in the fluid from six to twelve days, according to their size, then taken out and dried in the open air. Hollow organs, such as the lungs, &c., must be filled with the pre-

serving fluid, then placed in a vessel containing the same liquid, and afterwards distended with air and dried. Small animals, such as crabs, beetles, lizards, frogs, &c., if the natural colours are to be preserved unchanged, are not to be dried, but put immediately into the preparation. The same fluid may be used for the purpose of preserving human bodies during transportation, or even for more permanent embalming.

Treatment of Dextral Valvular Disease.—Dr. Alex. Morrison concludes his graduation thesis, on the subject of dextral valvular lesions, with some remarks on the treatment of these affections. He presents his views in the following propositions:—1. A more or less orthopnœic position is best suited to many cases of organic disease of the dextral valves; but there are exceptions to this rule, and the latter will probably most frequently be constituted by cases of pulmonary valvular lesion, and especially by cases of pure pulmonary regurgitation, just as we find a recumbent position best adapted to the analogous instances of aortic regurgitation.

2. The cutaneous circulation must be maintained by adequate warmth, and arterialisation of the blood by as free a ventilation as is compatible with the maintenance of sufficient heat.

3. Food must be given to patients suffering from dextral disease under the same restrictions as in the case of other cardiac sufferers, but fibrinogenous material must be even less consumed than in other cases, from the greater liability to spontaneous coagulation, and alcohol in one form or another is absolutely necessary, but must be cautiously administered.

4. Venesection is calculated to render signally good service in the retrograde plethora due to dextral valve lesions.

5. External applications must be employed in such cases under the same circumstances as in other forms of cardiac disease.

6. The use of ammonia, from properties peculiar to it, is indicated, but asphyxial conditions may render its combination with chlorate of potash or some other oxygenator advisable.

7. The employment of digitalis is not only useless in cases of organic disease of the dextral valves, but fraught with a danger which cannot be exaggerated, and the chief cause of its pernicious influence is probably its systolic action upon the left ventricle.

8. In functional valvular disease of the right heart, arising from ventricular dilatation, and especially in functional tricuspid regurgitation, digitalis carefully administered may prove very beneficial, by diminishing the capacity of the

ventricle, and restoring or improving the competency of valvular action.—*Edinburgh Med. Journal.* March, 1880.

A New Anthelmintic.—Dr. Lemos, in *Medizinische Neuigkeiten*, No. 34, 1879, states that the ocimum basilicum, a plant known in Buenos Ayres under the name of "albohaca," has an action of such a nature that worms in every stage of development rapidly leave their location after the juice reaches them. Its use is so much the more to be recommended since, if no worms should be present, no injurious effect results from taking the plant, but only a slight laxative and disinfectant action. Fifty grammes of the juice are given, followed in two hours by a dose of castor oil. A free discharge of the worms may be expected.—*London Med. Record.* 15th May, 1880.

Marriage between Blood Relations.—Dr. Costa (*Annales Méd. Psychol.*, January, 1880) thus sums up an exhaustive paper on the above subject:—1. Marriages between blood relations are not, as such, the causes of degeneracy in the offspring. 2. The relationship of parents favours the inheritance both of healthy and of morbid peculiarities. 3. Either perfectly healthy or diseased children may result from such marriages. 4. The latter are the more frequent. 5. The most frequently inherited defects are of a nervous nature. 6. Such marriages are to be unconditionally condemned.—*London Med. Record.* May, 1880.

Diuretics.—Dr. Maurel (*Bull. Générale de Thérap.*, 30th March, 1880) has lately conducted a series of experiments on the action of certain of the most commonly used diuretics, such as potassic nitrate, chlorate, acetate, and iodide, sodic salicylate, digitalis, colchicum, and squills, the latter in the form both of tincture and of oxymel. The experiments extended over a period of forty-six days, and were made on the same individuals. The general conclusions pointed to great uncertainty in the diuretic action of all these medicines; the most active was potassic nitrate, which increased the solid constituents as much as ten per cent in the twenty-four hours. The other substances gave an increase of from 5 to 6 per cent only. Digitalis alone gave constant results upon the excretion of water, which it notably augmented. The author believes that diuretics as a class, whether administered in health or in disease, have very little real power. In many cases the increased excretion, which they apparently induce, should rather be set down to other causes, such as changes in temperature,

nervous influences, or a "crisis" in certain morbid states. The real proof of the power of diuretics would lie in their augmenting the urine at periods when it was naturally suppressed, such as in the early febrile stage of many affections; but, judged by this test, all his experiments point to their being practically ineffectual.—*London Med. Record.* June, 1880.

Treatment of Gonorrhœal Ophthalmia.—M. Dor, of Berne (*Lyon Medical*, 7th March, 1880), employs benzoate of soda in all cases of purulent ophthalmia in new-born children that come under his care. In a case of diphtheritic conjunctivitis he used it as a disinfectant, together with tannin. The following case of gonorrhœal ophthalmia was also thus treated. A man aged 20, suffering from gonorrhœa, was, when first seen by the author, suffering also from purulent ophthalmia of both eyes, of four days' duration. M. Dor prescribed iced water compresses, and a solution of benzoate of soda (1 in 20), and solutions of tannin (1 in 10, and 1 in 100) as eye lotions, to be used every ten minutes. The next day the eyes were less painful, and in five weeks were well, the cornea being intact.—*London Med. Record.* June, 1880.

Sterility Treated by Alkalies.—Dr. A. Chanier draws attention to a cause of sterility, which is not usually recognised as such—simple hyperacidity of the vaginal secretions, without leucorrhœa or any derangement of health. After quoting several cases in support of his views, he concludes—

1. That in certain rare cases, in patients otherwise healthy, the secretions of the vagina may be acid in reaction, as indicated by their reddening blue litmus paper.
2. That this acidity may present an insurmountable obstacle to fecundation, spermatozoa being killed in a medium even slightly acid.
3. That the best remedy for this abnormal condition of the utero-vaginal secretions is the adoption of an alkaline regimen (alkalies internally, alkaline baths, and tepid alkaline vaginal injections.)
4. That when the utero-vaginal secretions become neutral the obstacle to fecundation is removed, and conception will probably take place.
5. That this disappearance of acidity under an alkaline treatment explains the success obtained in the treatment of sterility at the alkaline and sulpho-alkaline Spas.—*Bull. Générale de Thérap.* 15th June, 1880.

Action of Collodion on the Temperature.—Dr. Raducan has made some interesting observations on the effect produced on the general temperature by the external application of collodion; these he publishes in his inaugural thesis (*Thèse de Paris*, 1879). In health the effect on the central temperature varies with the site of the application. If the collodion be spread on either of the lower limbs the temperature is unaffected. But if the collodion be applied in such a way as to cover all the cutaneous surface corresponding either to the peritoneum or the pleuræ, an immediate and notable lowering of the central temperature is observed. Dr. Raducan thinks that the difference noted explains the therapeutic action of collodion in inflammation.—*Bull. Générale de Théráp.* 15th June, 1880.

Plastic Operations on Nerves.—Dr. Gluck, of Berlin, excised from the thigh of a hen a portion of the sciatic nerve, 2 ctm. in length; a somewhat larger piece was taken from the sciatic nerve of a rabbit, and placed in the gap left in the hen's nerve, and stitched in position there by means of catgut. On the eleventh day, the wound, which had healed by first intention, was opened, when the implanted portion of nerve was found firmly united at both ends to the nerve into which it had been inserted. On pinching the nerve above the part operated on, the muscles supplied by it twitched, which showed that perfect conduction of the nervous influence, through the whole length of the nerve, had been established. Many other animals were operated on in the same way, and with the same results. The results were the same, also, whether the animals whose tissues were thus interchanged were of the same or different species; and similarly the return of conducting power was noticed equally early, whether the portions of nerve inserted were placed in such a way that their central end was turned to the centre of the body, and their peripheral end to the periphery, or reversed. Primary union is necessary to the success of this experiment, and the bridge of new tissue must not measure more than 1 millimeter. When suppuration occurs, the ends of the divided nerve swell, and the introduced portion dies. Gluck found, further, that, some considerable time before the electric current was distinctly transmitted through nerves so operated on, simple mechanical irritation, such as pinching with forceps, called forth well marked muscular twitchings. He explained this by the statement that all the nerve fibres do not unite at the same time (a fact which was demonstrated with the

microscope), and that the electric current could therefore pass through only a certain number of these fibres. Pinching, on the other hand, operates on the whole diameter of the nerve. Traces of returning conducting power were sometimes observed within eighty hours after operation; but complete *restitutio ad integrum* did not occur till the end of a considerably longer time.—*Verhandl. d. Deutschen Gesellsch. f. Chirurg.* April, 1880.

Inhalations of Oxygen in Laudanum Poisoning.—A coffeeespoonful of laudanum was given by inadvertence to an infant of four months, which had diarrhoea. Extreme narcotism followed and death was imminent. Inhalations of oxygen produced a rapid improvement, which appeared to cease when the inhalations were discontinued. The recovery was complete in twenty-four hours.

A woman, asphyxiated by the fumes of charcoal, was rescued by the same treatment, which ought to be continued some time after apparent recovery.

M. Const. Paul, twelve years ago, published the history of a woman who had taken by mouth a spoonful of laudanum (Sydenham's preparation), producing severe vomiting, anxiety of countenance, while her respirations fell to 7 per minute. After having respired 20 litres of oxygen, she revived and spoke to her children. The recovery was complete.—*Créquy in Lyon Medical.* 14th March, 1880.—J. M.

Hysteria—Efficacy of Whipping.—M. Ad. Henrot relates, in the *Union Médicale et Scientifique du Nord-est* of 31st December, 1879, the case of a young female of 12 years, who was attacked suddenly without known cause, by convulsive fits, with suffocation, cough, barking, and œsophageal spasm. The fits were very frequent, and had shown themselves twelve days before M. A. Henrot saw the patient. Physiognomy was excellent, and there was nothing in the general state to indicate a serious disturbance of the nervous system. All the anti-spasmodic remedies had been tried without result, so that M. Henrot thought she deserved a more energetic treatment, which he had seen successful in similar circumstances. At the first fit occurring in his presence, M. Henrot beat the patient unmercifully with a napkin previously dipped in cold water. The fit ceased rapidly, and since then the nervous manifestations have entirely disappeared.—J. M.

A New Endemic Disease of Children (Winckel).—On account of the principal features of this disease, the author has designated it by the name of *cyanosis febrilis enterica perniciosa cum haemoglobinuria*. The mortality was 82 per cent for 23 infants attacked. Death supervened, on the average, in 32 hours. Symptoms:—cyanosis, icterus, urine pale or of a more or less deep brown colour; it may contain haemoglobin, normal vesical epithelium, many pavement epithelial cells, numerous granular cylinders, with red corpuscles, micrococci, accumulations of detritus, urate of ammonia, and a small quantity of albumen; stools abundant, and of an ochrey colour. No fever but rather lowering of the temperature; increase of the white corpuscles of the blood, which contain the debris of the red corpuscles; no sclerema; little sensibility of the skin; liver slightly increased in size; nothing in chest; convulsions; trembling of the muscles of the eyes; convergent strabismus.

At the autopsy, infarction of the renal papillæ, dilated stomach, numerous ecchymoses in the intestine, Peyer's patches and mesenteric glands increased in volume, hyperæmia of the mucous membrane of the larynx and bronchi, oedema of the brain, all the ventricles distended, manifest cerebral congestion, and several extravasations. Etiology obscure. (*Deut. Med. Wochensch.* Nos. 24 and 25).

The affection described by Winckel is evidently that which was the subject of a communication made by M. Laroyenne at the meeting of the Association held at Lyons in 1873, and of the thesis of Dr. Charrin (Paris, 1874).—*Lyon Médical.* 18th January, 1880.—J. M.

Renal Calculus of Extraordinary Size.—At the meeting of the Brooklyn Anatomical and Surgical Club, on 17th February, 1879, Dr. F. W. Rockwell presented a calculus which was a complete cast of the pelvis, infundibula, and calyces of the left kidney. It weighed, when removed, ten drachms. It measured, in its long diameter, $3\frac{1}{2}$ inches; in its circumference, at part corresponding to pelvis, $3\frac{5}{8}$ inches. It consisted of a central nucleus formed of urates and inspissated mucus, around which concentric layers of phosphatic deposits had accumulated, until a cast of the interior of the kidney had resulted. Only a meagre history of previous cystitis and pyelonephritis was obtained from the friends. At the autopsy the bladder was found filled with muco-pus; its walls were hypertrophied—the result of long standing cystitis. The right kidney was healthy and hypertrophied.—*Proceedings of the Medical Society of the County of Kings.*—J. M.

Books, Pamphlets, &c., Received.

Lessons on Gynecology. By Wm. Goodall, A.M., M.D., Professor of Clinical Gynecology in the University of Pennsylvania, &c. With 92 Illustrations. London : Baillière, Tindall & Cox. Philadelphia : D. G. Brinton. 1880.

Practical Lithotomy and Lithotrity, or an Inquiry into the Best Modes of Removing Stone from the Bladder. By Sir Henry Thompson, F.R.C.S. Third Edition, considerably Enlarged. London : J. & A. Churchill.

The Baths and Mineral Waters of Bath. By R. W. Falconer, M.D. Sixth Edition, Enlarged. London : J. & A. Churchill. 1880.

On Aneurism, Especially of the Thorax and Root of the Neck. By Richard Barwell, F.R.C.S. With Illustrations. London : Macmillan & Co. 1880.

THE
GLASGOW MEDICAL JOURNAL

No. IX. SEPTEMBER, 1880.

ORIGINAL ARTICLES.

ON THE TREATMENT OF BRIGHT'S DISEASE, WITH
SPECIAL REFERENCE TO THE USE OF DIURETIC
REMEDIES.

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(Read to the Medico-Chirurgical Society of Glasgow, on 7th May, 1880.)

NOTWITHSTANDING the numerous and valuable contributions of late years, at home and abroad, to the science and literature of Bright's disease, and the really considerable advances made, and still being made, in the pathology of those renal affections that make up the group so called, it cannot be affirmed, even by the most sanguine therapist, that the treatment of the disease has advanced in anything like a proportionate degree, since the time when the great English physician who, from 1827 to 1843, occupied the fore front of the whole field of inquiry ceased to take an active share in the controversies which resulted from his own discoveries. During that fruitful period, indeed, when the wards of Guy's Hospital were the leading centre of European interest as regards renal disease attended with albuminuria, there were not wanting many fellow-labourers who shared with Richard Bright the honour of contributing to the pathological and clinical revolution with which his name is rightly associated. Christison * in

* *Edin. Med. and Surg. Journal.* October, 1829; p. 262. See also the unfinished contribution of Dr. James Gregory, jun., on the same subject, in 1831-2. *Ibid.*, vols. 36-37. And the more complete work of Dr Christison, *On Granular Degeneration of the Kidneys.* 1839.

Edinburgh, Osborne* in Dublin, Rayer† in Paris, are names which will occur to every one as amply sufficient to preclude the idea of any hasty assent having been given to doubtful propositions emanating too exclusively from one centre, and biased by one prevailing tone of pathological and practical doctrine, even had it not been also the case, as it was, that Bright's conclusions were still further sifted by those who, like Elliotson, Graves, and others, approached the subject from a wholly different point of view,‡ and were thus disposed to minimise the value, and in some cases even to dispute the soundness, of the theories and practical results first announced from Guy's Hospital. And I think that any one who considers the whole progress of the subject during what may be called the first period of its evolution, must be struck with the remarkable impartiality, as well as comprehensiveness, of the various summaries of doctrine proceeding from Bright himself, showing, on his part, a degree of steady reliance upon facts, and a careful consideration of all adverse opinions, together with a freedom from personal prejudice only to be found, perhaps, among a few of the greatest masters in the art of medical observation. It is in no way surprising that opinions so faithfully formed and announced should have largely guided the practice of successive generations of physicians, especially as regards treatment, even while the very foundations of pathological doctrine, as to the nature of Bright's disease, were being subjected to renewed investigations, in accordance with the modern sciences of histological anatomy and chemistry. It is, I believe, strictly true that almost every important detail and principle of treatment in such cases will be found to have been anticipated, and more or less fully and carefully discussed, either by Bright himself, or by some of his eminent fellow-workers in the earlier period of research above indicated. Nay, it may even be conceded that in the works of still earlier observers, such as Withering, Wells, Blackall, and others,§ the use of remedies in those acute dropsies which were even then known to be sometimes associated with albuminous urine, or with scarlatina, and, therefore, corresponding closely with those since recognised

* *On the Nature and Treatment of Dropsical Diseases.* By Jonathan Osborne, M.D. London : 1834. Second edition, 1837. (First appeared in *Dublin Journal of Med. and Chemical Science.* January, 1834.)

† *Traité des Maladies des Reins.* Paris. Atlas of plates. 2ième livr. 1839-41. *Nephrite Albumineuse.* Paris, 1837.

‡ *Medical Gazette.* 4th December 1830, and 5th February 1831.

§ *Observations on the Nature and Cure of Dropsies, &c.* By John Blackall, M.D. 1813. Third edition, 1818.

as of renal origin, had received ample consideration; so that the way had been led, upon a more or less empirical basis, to results that afterwards received a new interpretation and significance through more strict and more thorough pathological investigation. And when, after so long a course of experience, we find that, for a whole generation, extremely little has been added to the positive resources of the physician that can be considered as at once secure and absolutely novel, it is not, certainly, with any hope of attaining much greater success that I have ventured on these remarks, but only because it may easily be conceded to one who has occupied the position of a hospital physician for more than a quarter of a century, and who has had to teach annually what he himself has seen to be probably true during that period, to attempt a brief review of his experience without, I trust, undue presumption, and with the view, indeed, chiefly of eliciting the opinions of others.

I propose, in the first place, in this communication, to indicate the position in which, so far as I am able to judge, the question of the treatment of Bright's disease was left by Bright and his immediate successors; secondly, without dwelling upon individual views, to show forth the direction in which modern opinion has been tending since the era of microscopical pathology; and, lastly, to explain my own conclusions as derived chiefly from clinical observation.

One remark may be made at the outset, as applying to the whole of the present inquiry. It is not necessary, for my present purpose, to enter into any of the difficult and still unsettled questions as to the ultimate pathology of Bright's disease, and the essential distinction, on one hand, or intermingling and coincidence on the other, of its various forms and stages. It will probably be admitted, even by those who have the most pronounced views on this subject, that the more chronic types of renal degeneration, and especially the waxy, amyloid, or lardaceous, on the one hand, and the interstitial, cirrhotic, or essentially atrophic forms of kidney disease on the other, present but little encouragement to dwell long on their therapeutic aspects; that in these forms it is even doubtful whether an opportunity is ever presented for the successful or special employment of remedies, unless when they are complicated by a more or less acute attack. In almost every case in which the question of treatment can be profitably discussed as a matter of doctrine, we have still, as in the time of Dr. Bright, to adopt as the basis of the investigation the forms of renal alteration which a lengthened experience has

shown to be the more curable, and which pathological investigation now usually connects with those disorders of the intra-tubular or epithelial secreting structures, known variously as *parenchymatous*, *desquamative*, or *tubal nephritis*. I by no means wish to be understood as adopting any exclusive view of the pathology even of the most acute and typical cases of this kind, in so characterising them. But it is requisite, for practical purposes, to have as clear an understanding as possible of the types of disease to which the following remarks mostly refer, and therefore, as well as for the reasons above stated, I shall, in the first instance at least, keep in view the forms of renal disease usually attended with dropsy or some correlated condition at an early stage, and in this stage commonly regarded (whether accompanied by fever or not), as *acute* or *sub-acute* nephritis.

In using these names, it is not, perhaps, wholly unnecessary to recall the fact, that the presumption which they infer of an inflammatory origin of the renal disease has, in the past, been responsible for a good deal of treatment which we must now-a-days consider as probably erroneous, or at least doubtful in principle; and at times, no doubt, fraught with a tendency to dangerous excesses. And it is well also to remember that Dr. Bright himself, even in a day when blood-letting was unhesitatingly performed, and recommended without the slightest reservation, in all diseases supposed to be attended by local congestion, showed himself (all things considered), extremely cautious in admitting, or even referring to, congestion or inflammation as the first cause or essential pathological condition of renal disease with albuminous urine. Even with the appearances before his view, presented in his well known fifth plate (chocolate-coloured kidney, case of Evans), with the fact before his mind of frequent haematuria as an early symptom, and with the belief in a general disposition to congestion and inflammation of internal organs as a consequence of the obstructed renal secretion, he hesitates in generalising so far as to pronounce upon the nature and origin of the renal alteration, and only in the most tentative and, as it were, ambiguous manner throws out the suggestion that it may be "the result of the various hurtful causes influencing it through the medium of the stomach and skin, thus deranging the healthy balance of the circulation, or producing a decidedly inflammatory state of the kidney itself."* No doubt, the therapeutic direction, "*mittatur sanguis, &c.*" occurs in these celebrated reports far more frequently than we can now defend

* *Reports of Medical Cases.* Vol. i, p. 3. London, 1827.

or justify; but the object of the venesection is usually not the latent and hypothetical condition of the kidney, but rather some of those *consequences* of the disease—*e.g.*, pneumonia, pericarditis, cerebral symptoms, which in those days were universally regarded in England as only to be met by free venesection and the antiphlogistic regimen generally. The real responsibility for the general use of the term *nephritis*, and all the practical consequences which may have been, for good or for evil, associated with the theory of inflammation as the essential character of the disease, rests with Rayer, and not with Bright, who expressly declined to dogmatise on the ultimate pathology of the various forms of renal alteration which he described and figured, and who evidently treated as an open question the relation of these various forms to one another, whether as stages of the same disease, or as affections differing in kind.

Moreover, it is only due to historical accuracy not to lose sight of the fact, that the treatment of acute dropsies by venesection, and other powerful antiphlogistic methods, was not in the first instance at all due to their being supposed to depend on renal, or on any other local inflammation. Such dropsies were recognised and classified as being inflammatory, *per se*, and in this respect distinguished from the dropsies produced by debility, or by cachexia, long before the time either of Rayer or of Bright. Indeed, it is not too much to say that the greatest impulse the antiphlogistic treatment of dropsies ever received in the present century, came from the work of Blackall, afterwards to be referred to, and in Edinburgh especially from the authority and example of Abercrombie, who, in 1818, published a most remarkable paper,* entitled “Observations on certain Dropsical Affections which are Successfully Treated by Blood Letting.” This well known paper should be carefully consulted by all who wish to understand the nature of the evidence on which practices now considerably, and perhaps too much, disused, were advocated in opposition to the humoral pathology, which, according to the distinguished author, had fostered “too much the habit of considering dropsy as a disease of debility.” It is difficult, even now, to resist the impetus of this very vigorous protest in favour of a very active practice; and, based as it undoubtedly was, upon large experience, it must, assuredly, have formed a part of the traditions consciously or unconsciously guiding the practice of

* *Edinburgh Med. and Surgical Journal.* Vol. xiv, p. 163. Compare also same vol., p. 479; and vol. xv, p. 58; vol. xviii, p. 225, for further illustrations of the same argument.

the later period, especially as Abercrombie, like Wells and Blackall, fully recognised the importance, though not, perhaps, the true pathological significance of albuminous urine as accompanying these acute and generally dropsical affections.

It is therefore probable, I think, that in English practice not much, if any, of undue proclivity to the extreme anti-phlogistic treatment in renal dropsy can be traced directly to the researches of Dr. Bright; although it is very probable that in France, under the influence of Broussais and his followers, M. Rayer's formula of "nephrite albumineuse" may have had its victims, especially if his own comparatively moderate recommendations and limitation of blood-letting to the acute forms should have been disregarded, as they were not unlikely to be, by the followers of Broussais, or by such sturdy and confident venesectionists as M. Bouillaud, even in Rayer's own hospital of la Charité.

But as we have still among us members of this Society who, from personal experience, have been led, like Dr. Kirk, of Partick,* to advocate as strongly as ever the use of venesection in acute renal dropsy, and as my chief aim at present is to set forth the historical position of that practice, rather than to affirm or deny its value, I shall pass to another point on which the researches of Dr. Bright may be supposed to have considerably modified (and on which I, at least, have no doubt that they did modify), the earlier practice. I mean the use, or disuse, of diuretics in many forms and stages of renal disease attended with dropsy.

It will, I suppose, be generally admitted that even when "inflammation" has not been the ruling idea in pathology; and venesection in practice, evacuations of some kind have always been a considerable part of the treatment in dropsical affections. Thus, in Cullen's day, the pathology of dropsy most in vogue was essentially humoral, † and accordingly he (although, as every one knows, no anti-venesectionist) scarcely alludes to venesection as one of the remedies, while he insists on emetics, purgatives, diuretics, and sudorifics, recognising, at the same time, their inadequacy or limited usefulness in many

* *Glasgow Med. Journal.* April, 1877, p. 145. Also discussion in Society. *Ibid.* p. 261.

† He places the disease "Dropsy," as did most of his predecessors in nosology, among the cachexie, and, therefore, apart altogether from the inflammatory and pyrexial diseases. This classification induced (as we have seen above) Abercrombie to protest that dropsy had been too much regarded as "a disease of debility." In more ancient times, as well as more modern, the existence of acute dropsies demanding blood-letting was freely recognised.

cases, because, "when the remote causes cannot be removed, the cure of the dropsy must be difficult, or perhaps impossible."* The preference among these, as well as the first place in the enumeration, is given to "purgatives of the more drastic kind;" but he adds that, "of late, an opinion has prevailed that some milder purgatives may be employed with advantage." It may be worth while to add, as perhaps having guided or originated the practice especially of our Scotch schools of medicine in this particular, that "the crystals, vulgarly called the cream of tartar," are specially commended as having, "in large doses, frequently repeated, sometimes answered the purposes of exciting large evacuations both by stool and urine, and have thereby cured dropsies."† I do not intend, in the present paper, to dive deeper into the recesses of antiquarian lore; but Dr. Dickinson may perhaps be surprised to learn that his own peculiar recommendation, and, in a certain sense, innovation, of large draughts of "spring water clear" was long ago advocated, in opposition to the theory and practice alike of almost all antiquity, by Cullen, confessedly at the instance of the "ingenious and learned Dr. Millman," who is said to have been "commendably employed in restoring the practice of giving large quantities of watery liquors for the cure of dropsy," not only by "instances from his own practice, and from that of several eminent physicians in other parts of Europe, but also from many instances in the records of physic."‡ At the same time it will be admitted that the old and established practice

* *First Lines of the Practice of Physic.* Edit. 1808. Sect. 1675, *et seq.*

† The use of cream of tartar in anasarca, however, extends back to Boerhaave, or his commentator Van Swieten. See under Aph. 1237, where the curiously chemical explanation given of its action shows the essentially humoralistic pathology followed. So also of the saline compound which follows in the same paragraph, and which is essentially the acetate of ammonia, or saline diaphoretic of later therapeutists.

‡ The work here referred to, which has probably been long forgotten, except by book collectors, is thus entitled—*Animadversiones de Natura Hydropis ejusque Curatione.* London, 1779. It was translated into English by Swediaur, in 1786, and appears, according to the slight biographical notice in the *Roll of the Royal College of Physicians of London*, vol. ii, p. 316, to have been the first fruits of a Radcliffe travelling fellowship, followed by an appointment to the physicianship of the Middlesex Hospital; which, however, he resigned in the same year as the publication of this book. The author, who was created a baronet in 1800, was quite a considerable person in his day; and the work in question is by no means devoid of interest, especially in respect of the account given in it of the cure of dropsies by Bacher, a French physician, which was favourably reported on by M. Richard, "the celebrated physician of his most Christian Majesty," at the request of the King.

was much more largely founded upon the dread implied in Horace's well known line—

“Crescit indulgens sibi dirus hydrops,”

and on the supposed fact that a large quantity of liquid drunk at one time had, in a certain proportion of cases, been an exciting cause of dropsy; the corollary being that abstinence, either partial or complete, from liquid potations was often enjoined as a part of the cure. Cullen's remarks upon this are extremely sensible. The conclusion from the facts is, to him, doubtful; the alleged fact itself “very rare.” . . . “With respect to the total abstinence from drink” (non-alcoholic, be it observed) “it is a practice of the most difficult execution; and, therefore, has been so seldom practised that we cannot properly know how far it has been effectual. The practice of giving drink very sparingly has, indeed, been often employed; but in a hundred instances I have seen it carried to a great length, without any manifest advantage; while, on the contrary, the practice of giving drink very largely has been found not only safe, but very often effectual in curing the disease.”

The practice of Cullen and his school, therefore, though not over sanguine, and, indeed, fully recognising a large class of practically incurable cases, was not at all unfavourable to the use of diuretics, among other ways and means of evacuation. In this respect he only followed up the traditions extending from Sydenham* downwards in the English school of medicine; and largely also the practice of all preceding ages.

Coming down now to the period immediately preceding the researches of Bright, we may refer briefly to the remarkably comprehensive, and at the same time original, work of Blackall on *Dropsies*, which went through four editions between the years 1813 and 1824, and which, it is certain, was well known to the great pathologist of Guy's Hospital, and had guided him†

* See especially *Tract. II, de Hydrope*. Sect. 32.

† I do not know if this fact is, even now, fully appreciated by the majority of those who have written upon “Bright's disease”; and as it detracts nothing from the real and accepted reputation of one of whom English medicine is justly proud to acknowledge the obligations which he himself clearly indicated to a less known predecessor, it may be as well here to give the following dates, which have an important bearing on what is said in the text. John Blackall was physician to the Devon and Exeter Hospital, and drew the most of his materials from observations there made. The first edition of his work on *Dropsies with Coagulable Urine*, appeared in 1813, and the subsequent ones in 1814, 1818, and 1824. Bright's first vol. of *Hospital Reports* was published in 1827; and at p. 3 he acknow-

largely in his experiments upon the urine, in connection with the forms of renal disease with which his name is now for ever associated. Even had Bright never lived, or never written these imperishable records of fact and sound clinical experience, it is certain that the connection of albuminous urine with general dropsy could not have been disregarded in pathology and in practice ; and the connection of this symptom in a very special sense with the immediate origin of those acute dropsies called "inflammatory," was also clearly defined by Wells, Blackall, and in 1818 by Abercrombie. But the only practical consequence that emanated from this discovery was a new impetus given to venesection in the early stages, and the most acute forms, of the dropsy. The analogy of treatment in this "flux of serum," according to Blackall, is not to be drawn from the inflammations, strictly so-called, so much as from the haemorrhages, which, according to Stahl (he says), "are cured by moderate depletion, but by the use of astringents and tonics are converted into dropsies." So much is this the case that he recognises a "hydropic diathesis, of which the watery accumulations form sometimes but a small part, and seldom deserve that exclusive attention which they receive." This diathesis is attended by signs of "inflammation of the *habit*" (not, be it observed, of the *kidney*), and they require a treatment accordingly, either by direct antiphlogistics, or by such hydragogue medicines as "are likewise calculated to reduce inflammation." There may, indeed, in such cases, be very little dropsy, and little occasion, therefore, for hydragogues at all, while yet, "the system suffers more severely, and under a more intense inflammation, than is usual in very extensive dropsies." Local inflammations may indeed take place, as pneumonia, or abdominal inflammations, such as clearly to require venesection ; or this heroic remedy may be required even on account of the cedematous swellings alone, in such circumstances. "A correct guide to it may be found in the firmness, copiousness, and early appearance of coagulum in the urine ; its limits, in the improvement of that discharge, the state of the blood, and the relief of the other symptoms." He is confident, from experience, that where bark, steel, and similar remedies have failed, or even increased the disease, blood-letting, judiciously and moderately performed, has given relief ; and he is not, apparently, deterred by mere exhaustion of the patient from using the lancet, for

ledges Blackall's "most valuable treatise" as giving observations on the urine in complete accordance with his own ; while at p. 5 it appears that the first observations tending to connect accurately coagulable urine with diseased kidney were made in 1825.

"it is sometimes the only evacuation which can be directed for cachectic patients, their stomach rejecting both laxatives and diuretics; whilst the ease with which they undergo this operation, as well as the relief they experience from it, are truly surprising."*

But with all this confidence in the supreme antiphlogistic remedy, there is no disposition in Blackall's work to disparage other remedies, especially of the evacuant order. "Certain purgatives and diuretics are, with him, remedies of great value, and his only care in recommending them is to select such as will really prove hydragogue (in the sense of removing the effusions) without an undue strain upon the system, or the risk of aggravating the inflammatory tendency by exciting local inflammation. Hence, he is disposed, relatively at least, to discourage drastic purgatives—*e.g.*, scammony, gamboge, elaterium, jalap, and the like, on account of "the temporary heat and fever they are apt to excite, the uncertainty and distress of their operation in patients difficult to be purged," and the necessity for their very frequent repetition, with a weakening effect, both generally and on the digestive organs. In cachectic subjects they are inadmissible on this account; they are useless in hydrothorax, where, on the other hand, the maxim of Baglivi applies—"in morbos pectoris ad vias urinæ ducendum." . . . "Altogether, their use is much less extended since the introduction of digitalis, and of the proper mode of exhibiting crystals of tartar; and without much injury to the practice of physic may, perhaps, be safely superseded by these."† The saline medicines here referred to, indeed, "are, in the truest sense of the word, diuretic, as well as laxative, and promoting all the excretions. Whilst they unload, they cool, without leaving that extreme debility of the intestines so much to be dreaded from hydragogues; and the constitution is rendered by their use daily more fit for the exhibition of tonics." The salines which he thus so decidedly prefers to the vegetable drastics are "those into the composition of which the tartaric acid enters; as the tartrate of potash, the supertartrate of potash or crystals of tartar, and the tartarized soda." These may be given combined with more decided laxatives. "But there is likewise something very advantageous in the influence which saline remedies exert, by being given in such a form as to enter the circulation, and, of themselves, to open the secretions, which are undoubtedly deficient in dropsy; those from the

* *Op. cit.* Third edit. Ch. xv. Sect. i, pp. 282-7.

† Pp. 288-90.

skin, the kidneys, and the bowels, obviously so. With this intention, the supertartrate of potash is usually selected, and is given from half-an-ounce to an ounce daily, diluted with water only, or with such additions as are necessary to render it agreeable to the stomach. The mildness of this remedy, the length of time during which it can be continued in a smaller dose as a dietetic, the solvent power which it seems to exert over the cause of the distemper, place it in the very first rank. How much more satisfactory and more likely to be permanent is such a cure than that which tears to pieces whilst it unloads? It approaches to the cure by diet, which undoubtedly is the most desirable of all, and imitates most nearly the operations of nature. A scanty urine, loaded with a lateritious sediment and with serum, is an indication for the use of this as well as other saline remedies. It is contraindicated by a pale watery condition of that discharge, in which likewise there is generally a predominant acid, and by a certain appearance of feebleness in the kidneys. Often I believe, it unloads the urine entirely. I have known it do so partially only; but with such effect, that tonics easily perform the rest."

I have quoted this passage from Dr. Blackall's book at length, because it contains, in my opinion, a great amount of valuable truth, which has since his time been somewhat lost sight of in many quarters. One thing is perfectly obvious from it—viz., that this clear-sighted and most diligent observer, with his mind fixed upon the "coagulable urine," as the index, in some degree, to the character of a dropsy, and as guiding its treatment, saw no objection, in principle or in fact, to the use of diuretics as such. For he goes on to say in the next chapter that "the urine is so generally affected in dropsical swellings, as *very naturally to suggest* the use of diuretics." The real objection to diuretics, according to Blackall, is their uncertainty; and, just as in the case of the more violent or hydragogue cathartics, the tendency of some of them to heat and stimulate, such as oil of turpentine and cantharides, or to act as astringents and tonics, like the preparations of copper. These, therefore, he rejects, especially as they have no specific power of correcting the coagulability of the urine, and he has even thought that the tincture of cantharides has increased this tendency to coagulation. But it is quite otherwise with the saline remedies already mentioned, "particularly the crystals of tartar." The acetate of potash, called by the old writers specially *sal diureticum*, might be supposed to be of equal value, but is not so; "perhaps, however, it may be well suited to

those circumstances of the disease in which the urine is pale, and not scanty, and remains long free from putrefaction."

The only other diuretics he mentions are tobacco, as recommended by Dr. Fowler, of which he has no particular experience; squill, of which he says that it is chiefly useful in cases where the urine is scanty, with a sediment, and *not coagulable*; and digitalis, which he regards as adapted specially to the converse class of cases, or those in which it is *scanty, or even loaded with blood, and coagulable*. The grounds in detail of these distinctions are, however, perhaps not of so much consequence to us as the fact of the recognition of diuretic practice in general, and the comparatively unreserved approval given to the saline diuretics.

Now, it is in this respect that I am of opinion that the impetus given to pathology by Bright's great discoveries had, in some respects, an unfavourable influence on the medical treatment of dropsies, especially in London and in England; but more or less all over the world. The mere idea that the kidney was unsound, still more that it was inflamed, was sufficient, with Bright himself and all his immediate followers, to beget an apparent unwillingness to employ diuretics at all; and certainly also a very great comparative bias towards purgative practice as opposed to diuretic, from the fear of increasing the albuminuria through the latter. That Bright did not altogether forbid the use of diuretics, I freely grant; and that he preferred the saline diuretics in some cases, according to the rule of Dr. Blackall, is also evident; but his use of them was timid and hesitating as compared with his employment of drastics, and even of blood-letting, and that of his followers still more so. And without going into details more than is necessary, I think it may be generally affirmed that in all the works of most considerable reputation produced in the London school, almost without exception, or at least with the one exception of Dr. Dickinson's, there has continued to be, down to almost the present hour, a lingering prejudice that it is much better practice even to excoriate the bowels from day to day by the most drastic hydragogues, than to use habitually even the mildest diuretics, on the ground, stated or implied, that the kidney is the tender and wounded part, which *needs to be kept as much as possible at rest*, just like a wounded limb or an inflamed lung. I admit that this doctrine is not so strongly stated as formerly in some of the later productions of the London school; but still it is there as an influence, and it has happened to me again and again, when acting as an examiner, to put a question to English students upon the subject, and to

find them under the impression, stated usually without reservation and as a matter of clear principle and indubitably correct doctrine, that you must rarely, if ever, employ diuretics in Bright's disease, especially in its more acute forms, but always purgatives, *so as to spare the kidneys.*

In the Irish School of Medicine, and at a later period elsewhere also, the opposition to diuretics took a different form. The interesting and valuable work of Dr. Jonathan Osborne, *On the Nature and Treatment of Dropsical Diseases*, was published in 1835. This work, following close on the observations of Bright, Christison, and Gregory, and practically expounding and defending the views of the English pathologist, at once arrested attention; and the independence of its doctrine, in regard to treatment, has made it one of the early *classics* in relation to Bright's disease. The idea of bringing the skin to the rescue as an eliminating organ, not exclusively, but so as to save at once the bowels and the kidneys, is, as every one knows, the ruling idea of this work; and it is elaborated with admirable consistency and thoroughness, as well as with large knowledge and without more of prejudice than is implied in the acceptance of the general principle suggested by Bright's previous writings. It may be added that the whole, or nearly so, of the most modern treatment in Germany, as expounded in the admirable, well informed, and original memoir of Bartels, in *Ziemmsen's Cyclopaedia*, is in accordance with Osborne's views.

Now, I have no objections at all, except such relative ones as I shall presently state, to the eliminative or evacuant practice of Osborne through diaphoretics, either in its original form or as modified by the German physicians. I believe that, in many cases of Bright's disease, the care of the skin-function, within reasonable limits, is exceedingly important, and the means proposed for exciting its activity in transpiration well adapted for the purpose. Nor am I altogether opposed to the specially English practice of using strong purgatives. But what I venture to affirm, as the result of at least twenty-five years' experience, is that these means do not need to be employed merely *to save the kidney*, in the sense indicated above; and that the employment of the milder diuretics, even when not, *per se*, effective or sufficient, is by no means to be avoided or, in most cases, postponed to other modes of treatment. In other words, I hold, as the result of *simple clinical experience*, apart altogether from theory, that *diuresis* in Bright's disease is not a thing to be avoided, but to be promoted if possible; and, therefore, that diuretics, *per se*,

so far from being proscribed, should form a part of all good treatment in most cases, even of the acute and sub-acute forms; and, further, that diuresis is commonly at once the index and the result, both of successful treatment by other therapeutic methods, and of the spontaneous resolution of the disease. In this, as in most other cases, I find that the most eligible therapeutic course is to study and to assist nature, rather than to act in a perturbatory sense, in obedience to theory, but in opposition to the plain dictates of experience.

The essential safety, as well as therapeutic importance, if not pre-eminence, of the milder diuretics in the treatment of both acute and chronic Bright's disease is not by any means a new or a rashly-adopted doctrine. It was all along, I believe, in a degree, that of the Edinburgh School, whatever may have been the qualifications and compromises apparent in some statements of it. In his earliest contribution on the subject, in 1829, only two years after the publication of Bright's earliest researches, Dr. Christison insisted on diuretics, and especially on supertartrate of potass, particularly as tending to increase the solid contents, as well as the water of the urine. "The main purpose," he writes, "served by diuretics is to increase the daily quantity of the urea and other salts usually thrown off by the urine. In this respect the action of diuretics deserves particular notice. It is not merely the quantity of aqueous secretion that is increased by their means. The solid contents are generally increased in nearly an equal proportion—that is, while the daily quantity of urine is increased, the urine retains its specific gravity, or at least does not lose it in nearly the proportion that its quantity is augmented. . . . This fact renders the beneficial operation of diuretics very intelligible. They enable the kidneys to throw off the quantity of salts and hyperazotized matter, which is daily discharged in the healthy state, whose discharge is essential to the preservation of health, and the deficiency of which in the urine is doubtless the cause of the dropsy and other affections observed in the disease under consideration."*

These observations, very obviously the result of careful chemical analysis (as appears from the instances given), are strictly in accordance with all the information of an exact kind which has accumulated since, and, to my mind, they form the most concise and satisfactory statement of the use of diuretics in Bright's disease ever published. But, in his later monograph, published in 1839, Dr. Christison had already to contend with the, as yet, only half-matured, though already

* *Edin. Med. and Surg. Journal.* Vol. xxxii, pp. 288-9.

often expressed, prejudice against diuretics: which, he says, "the best authorities now agree in discarding" in the early stage. "To this doctrine," he adds, "*but with certain limitations*, my own experience leads me likewise to accede. During the state of general reaction usually prevalent in the cases which are detected in this stage, diuretics do not readily excite their proper action; and the urine is restored to its healthy amount with much greater certainty by subduing reaction—that is, by the antiphlogistic measures already mentioned. Besides, it may be fairly asked what precise purpose is to be served by the induction of diuresis with internal remedies, so far as regards the primary disease. It does not appear very evident in what way diuresis brought on artificially will lessen the tendency either to inflammatory action, or to albuminous secretion, or to morbid deposition. But, further, some late authors have plausibly argued that diuretics are even positively hurtful, because by their stimulus they add to the irritation which already exists, and thus actually increase, instead of diminishing, the tendency to morbid secretion and nutrition. One of these, *Dr. Osborne*, has carried his distrust of such remedies so far as to assert that they may actually produce the disease.

"Here, however, it appears to me that the argument has been pushed too far, and to the establishment of a serious practical error. It does not follow, because diuretics, by their stimulus, cause increased flow of natural urine, that they will also cause an increase of morbid secretion. The irritation which excites the former may be different from that which excites the latter. That they really are different in kind would appear probable, as well from the extreme difference of their products, as from the fact that diuretics, when they increase the flow of urine in this disease, very rarely, so far as I have observed, increase the albumen which, in the early stage, may be held to be a correct measure of the degree of morbid irritation. I have even repeatedly seen the albumen disappear under diuretics. But, if the two irritations be different in kind, we may infer from numberless parallel instances in regard to inflammation and irritation in the organs and textures of the body at large, that the one may be induced, without necessarily increasing, nay, possibly enough with the effect of diminishing, the other. Theory, therefore, is not at variance, as some imagine, with the employment of diuretics in granular disease of the kidneys. Neither, for my own part, have I had occasion to observe any distinct facts which would lead to a conclusion in any way different. Diuretics,

I repeat, do not increase the coagulability of the urine in the early stage: in many instances they seem to diminish it. In the advanced stage there are no easy and sure criterions for judging of the progress of the primary disease; but, so far as one may judge, it does not appear that disorganization at this period is promoted by the operation of diuretics.

"The views here discussed seemed called for,—not because I would infer that diuretics are positively useful, and ought to be resorted to, in respect of the primary disease, whose treatment alone is under consideration at present,—but because the unnecessary dread of an evil influence from them over the primary disease has led several estimable authorities to forbid their employment likewise in all secondary affections, in some of which no other remedies are so promptly efficacious, and where such experience as I have had would justify the belief that they may be made use of with perfect propriety." *

The careful perusal of Dr. Christison's cases (particularly cases 19 to 31) with the remarks appended to each will, I think, show that his own original statements of fact in favour of diuretics had never been in his own opinion really shaken; although in this work, and still more in the short résumé of treatment included in Tweedie's *Library of Medicine*, vol. 4, p. 292, an appreciable amount of uncertainty of tone is observed, due to the overwhelming influences of authorities on the other side. The traditions of the Edinburgh school, however, preserved the unmodified favourable opinion of the earlier work; and, without any conscious doubt or controversy on the subject, without even, so far as I remember, reading the original documents with the care that a controverted opinion would have suggested, I was led insensibly by the experience of my own tutelage to adopt the diuretic practice with all the freedom and confidence indicated by the view of it formulated in the first of the extracts given above, from Dr. Christison's early memoir. Bleeding was at this date beginning to lose favour (1845), and my own opinion was rather at this period against it on the whole, so that I do not remember, except in one or two cases of uræmic convulsions, being ever led to employ it in renal dropsy at an early stage of my practice. The alternative, therefore, in acute and subacute, as well as chronic cases, was diuresis, chiefly through cream of tartar, and sometimes purgation by the same in larger doses, united or not with jalap or gamboge. To this practice I have, in the main, adhered as a routine, and the

* Christison *On Granular Degeneration of the Kidneys, &c.* Edinburgh. 1839. Pp. 138-141.

safest on the whole for ordinary use; and although I can remember (as was inevitable) many failures, yet I have also witnessed many favourable results, both in chronic and acute cases; and in the latter at least, some which cannot be called other than cures. In speaking of these, I have not in view cases of scarlatinal dropsy, which I rarely see except in consultation; but the ordinary miscellany of hospital cases, unselected, and including, of course, a considerable proportion of damaged organs and unhealthy constitutions, with incidental acute attacks, as well as acute cases properly so called. I at one time intended to accompany this paper with a synopsis, not, indeed, of my whole hospital practice, but of the more notable cases in the Western Infirmary, reduced to a brief abstract or summary; but I found it would not be at all an interesting document to read, though a rather laborious one to prepare. Something like this has already been done with great care by Dr. Finlayson, in the *Glasgow Medical Journal* for January, 1874, which contains a valuable summary, with remarks, of 45 renal cases in the exact order of their occurrence in my wards for October 1872 to August 1873, in the Royal Infirmary; other forms besides Bright's disease, however, being included for the sake of completeness. A few cases occurring in a single winter session were also recorded in my *Clinical Medicine* in 1862, as bearing on treatment; but I am very sensible that no exact conclusions can be drawn from such records, nor would it be easy to convey, by any process short of watching the details of the individual cases on a large scale, the evidence on which my present assertions rest.

Returning, therefore, to the form of dogmatic statement, as the only one practicable under the circumstances, I venture to affirm that my experience entirely corroborates the early statements of Dr. Christison, that when the more mild saline diuretics can be brought to act at all in renal disease, they by no means tend to increase, but rather greatly to diminish, the proportion of albumen in the urine; and that at the same time the specific gravity (as indicating the urea and salts) is, in recent cases especially, relatively increased as compared with the quantity; or, in other words, as quantity increases and albumen diminishes, the total excretion of the normal solids (urea, salts, &c.) in 24 hours is notably increased. Even when such diuretics fail to act, however (perhaps in some cases from not being absorbed), or when they act in the first instance as purgatives, they do no harm, according to my experience; and, on the other hand, they are often greatly assisted in acting as diuretics by a previous and temporary phase of action

(either alone or in combination) as purgatives. Hence the association, long in such favour in Edinburgh, of cream of tartar with jalap, or with gamboge, in renal cases; my own practice being usually to give the compound jalap powder in doses of gr. x-xxx every few hours until purgation is established, which is followed up by cream of tartar solid, in electuary, in gr. xx doses; and finally, when diuresis occurs, as often happens in a few hours, it is kept up by the cream of tartar in solution given alone, or with orange or lemon peel (imperial drink) indefinitely, and with the happiest results. I think it is not too much to say that I have never seen any injurious result whatever follow from this mode of treatment, if watched with ordinary care. I therefore much prefer it on the whole to the treatment by digitalis, or by any vegetable diuretic, which might, under certain circumstances, prove poisonous if long continued; and I need not say how much I prefer it to continuous drastic purgation, however accomplished, in a class of cases so often tending to death by exhaustion.

Dr. George Johnson in his later works, Dr. Dickinson, and others, insist much on the occurrence of spontaneous diuresis in Bright's disease as one of the incidents of recovery from renal dropsy; the inference being that it will occur under any treatment. This fact was not unknown to the earlier observers, and has long been known to me; but, I claim it as one of the best arguments in favour of the diuretic practice, not only in the chronic, but also in the acute and subacute forms of renal dropsy. The theory of such spontaneous crisis may admit of a good deal of discussion as a pathological question; but surely the fact of a movement towards cure being shown forth in this way, rather than in another, spontaneously, should tend to raise a presumption in favour of, rather than against, the attempt to imitate nature by simple processes closely allied to her own. It is, of course, difficult to prove, in any particular case, that the crisis apparently brought about by diuretics was *not* spontaneous; but from the practical point of view it is of no great consequence, and in a large number of cases carefully watched, it is impossible, I think, not to gain a positive conviction, that the remedies have in a considerable proportion contributed notably to the result. In fact, I am pretty sure, from my own observations as well as from the recorded facts in renal dropsies, that almost any kind of evacuant remedy, from blood-letting to purging, and from the latter to diaphoresis, will often bring about a diuretic crisis; and it is precisely this conviction that has led me to employ other artificial

evacuations, in certain urgent or obstinate cases, simply as preliminary remedies, leading up, as soon as possible, to the much safer, because more natural, use of diuretics.

A consideration urged by Dr. Dickinson is not without a bearing on this subject. It is the basis of his recommendation of large draughts of cold water in renal dropsy. The obstructed tubuli uriniferi need flushing—they must therefore have an abundant supply of fluid to the blood to do this work. I have no objection to urge to this theory, nor do I unreservedly adopt it; but I desire to note that it logically includes, or connotes, a more or less complete abandonment, by this able English physician, of the fundamental idea, or prejudice, which was allowed, as I think, an undue influence in English practice, tending, as we have seen, to discountenance the use of diuretics in Bright's disease. Turning in a stream of water upon the kidney (if it could be thus artificially accomplished) is no more giving it physiological rest than would be the administration of mild diuretics.

Dr. Dickinson's idea, however, must be regarded as in a very decided sense a protest against an extreme purgative or diaphoretic practice, even if it should not be considered to countenance active saline diuretics. On the other hand, Dr. G. Johnson argues, in view of this objection to diaphoretics, that external warmth and diaphoresis, by relieving renal congestion, will allow of the spontaneous diuresis, secondarily occurring, which is required by the theory. You see how difficult it is to get rid of embarrassing speculations in a subject of this kind. It is better for us, on the whole, to rest on established facts.

I am, however, by no means unfavourable to diaphoresis, and have, especially of late, since reading Bartels' articles, begun to employ it again more freely than formerly. As yet I am obliged to confess that the resources of our hospitals do not, at present, give us such command of diaphoretic methods as to convince me of their power to supersede all others. I have long thought of, and have not rarely employed, in private cases, the Turkish bath, with fair results on the whole, but it is only in a few cases that either from this or from the ordinary vapour or hot air baths, I have been able to observe such unequivocal results as to induce me long or steadily to persevere with them. In a few more recent cases I have used pilocarpine injections every second day, of from $\frac{1}{8}$ to $\frac{1}{4}$ grain; and as some of these cases were very decidedly benefited, after all other remedies had been resisted, it is only fair to presume that further good results may be obtained.

In uræmic cases generally I still prefer the old method of

purgation by very active hydragogues to any other evacuation; partly on account of the well known experiments of Bernard and Barreswil, which show that in animals in whom the kidneys have been extirpated, a quasi-vicarious elimination of carbonate of ammonia takes place into the alimentary canal, with the result apparently of prolonging life. In these cases, however, and in others of like urgency, I am by no means wholly averse to the use of blood-letting, which, as I have already said, appears to have, in favour of its primary good results, an amount of evidence more overwhelming than can be presented on behalf of any other remedy.

Finally, and to put into a single sentence the main object of this paper:—I by no means claim to have discussed at all completely the treatment of Bright's disease, nor have I even alluded to several remedies—e.g., gallic acid, benzoic acid, fuchsin, of which I have made personal trial, with various results. But I hope to have shown, once for all, that in almost all stages of the disease there has been an undue tendency to depreciate or exclude diuretic remedies, and that these, judiciously employed, without pretending to an absolute supremacy, are at once the safest, and in many cases the most effectual of the means of dealing with dropsical symptoms, while, as Dr. Christison has pointed out, their legitimate function is not merely to get rid of a single symptom, but by aiding the natural process of excretion by the kidneys, to ward off the dangerous accumulations in the blood, which lead in time to what is called uremia. To restore by remedies this natural function, we must needs employ, in any case, methods of elimination that are more or less closely allied in their action to the physiological processes which it is desired to arouse and quicken; and hence, as I venture still to be of opinion, the experience of ages, here quite in accordance with a sound theory, has practically demonstrated the advantage of employing in such cases the cream of tartar in its solid as well as liquid forms of administration, followed or accompanied by other mild diuretics, or by digitalis; a mode of practice extending back, as we have seen, to the last century, if not to much earlier periods, and only apparently discredited by prejudices arising from the pathological researches of Bright. My argument in this paper is that the principle of this practice, or the practice itself, ought to be carefully maintained, or restored again more generally, in the treatment of this disease. As to the employment of tonics, nutrients, chalybeates, and other haematics in the later stages, there is practically an universal consensus of opinion.

PRACTICAL PAPERS ON THE MATERIALS OF THE
ANTISEPTIC METHOD OF TREATMENT.

By GEORGE BEATSON, B.A. (Cantab.), M.D. (Edinb.)

VI.—ON ANTISEPTIC SUTURES.

(With two Woodcuts.)

In my previous papers I have dwelt upon the substances used as lotions and the materials employed as dressings in Lister's antiseptic system, and in the present communication I propose to speak of the means adopted for ensuring union in antiseptic wounds. In other words, the subject of this paper will be antiseptic sutures.

Antiseptic Sutures.—The term *suture* (Latin *sutura*, a seam), when used in anatomy, indicates the line of junction of different bones, but in surgery it is applied to the materials used for stitching wounds, so as to maintain the opposing surfaces in contact, and thus secure union with freedom from any scar, or at all events with the smallest possible cicatrix. The materials recommended and used for this purpose have varied from time to time, but in Lister's antiseptic system there are only four with which we need concern ourselves. They are *wire*, *silk*, *catgut*, and *horse hair*, and I shall speak separately of each; but before I do so I shall briefly allude to a substance which can hardly be reckoned a suture (though by the older surgeons it was termed "dry suture"), but which is sometimes employed for bringing together the edges of wounds, or affording them support so as to prevent any strain upon the tissues. I refer to adhesive plaster.

Adhesive Plaster.—Of the different plasters used in surgery the one to which the term *adhesive* is usually given is the ordinary strapping or sticking plaster, known also by the name resin plaster, as it consists of a compound of resin, litharge, and soap, spread very thinly on one side of light calico, the resin being added to render it sticky on the application of heat, and thus cause it to adhere. Unbleached calico forms the best basis for this plaster, as its somewhat downy surface affords a firmer union to the adhesive materials, whereas when glazed cloth is used the plaster frequently cracks and peels or drops off. Sometimes, where a stronger article is needed, as for making extension by means of weights, or for supporting diseased joints, the plaster is spread on dimity or twilled calico; but as a general rule in surgical work the lighter variety is

found sufficiently strong for supporting the tissues or bringing the edges of wounds together. It is now entirely machine-made, the apparatus employed stretching the cloth tightly and spreading the plaster upon it much more evenly than could be done by hand. It is then cut into six-yard pieces and rolled up.

In carrying out Lister's system, the need of this plaster was felt in some cases, but in its ordinary condition it could not be employed, as it contained no antiseptic ingredient, and if applied to a wound directly it could not but introduce some septic mischief. The difficulty was overcome by momentarily dipping it into a hot carbolic solution, which would destroy any organisms adhering to its polished surface, and would render it aseptic at the moment of application, just as the protective is, while the spray and external gauze dressing would ensure it remaining so. The following are Mr. Lister's directions as to the manner of using it. Speaking of the dressing of an amputation and of the tendency that the flaps sometimes show to retract, he says:—"If strapping is required, common adhesive plaster may be rendered antiseptic by dipping it for a second or two in a watery solution of the acid, and it is most convenient to have the lotion hot (say one part of one to twenty with two parts of boiling water), so that the strap is warmed at the same time by its immersion. It can then be applied effectively under the spray, which should always be used in changing the dressings of a stump till the wound has become superficial." (*Holmes' System of Surgery*, vol. v, p. 624). While, then, adhesive plaster may be safely used in Lister's antiseptic system if dipped in a hot carbolic lotion and applied under the spray, there is one other point to which I would direct attention in connection with its employment. It must be borne in mind that the strapping, like the protective, though made antiseptic at the moment of application, has no antiseptic virtue in itself, and must be well overlapped on all sides by the external dressing. Mr. Lister thus alludes to this matter of detail. "The ends of the adhesive straps should be overlapped by the gauze to prevent them from subsequently conducting putrefaction inwards." (*Holmes' System of Surgery*, vol. v, p. 624). Useful, however, as the strapping undoubtedly is in certain cases, it will be seen, when we speak of the button suture, that its introduction has more or less done away with the need of it. Still, under certain conditions, its application might be necessary, and so I have thought it advisable to include it in these papers. It may be as well to add that the following points that require attention in applying adhesive

plaster under ordinary circumstances must be equally carried out when it is used antiseptically in Lister's system. (1.) A sheet of plaster, before being used, should be wiped briskly with a dry cloth to remove the particles of dust and plaster which collect on the surface of it. (2.) Before applying strapping to any part of the body all hairs should be shaved off. If this is done at the time of the operation, or during the dressing of the case, the scalpel employed must be dipped in carbolic lotion and rendered antiseptic. (3.) Strapping being used as a support, and to exercise some traction on the tissues, the strips should be cut in the direction of the *length* of the web, and not across it, for if cut across the breadth they will stretch and become useless. (4.) The strips should be of sufficient length to support the sides as well as compress the edges of the wound. (5.) The strips should not be too broad, and they are better cut slantingly towards the centre, so that their middle portion, which is over the wound, is narrow, while the ends that adhere to the skin and sides of the wound are broad, and thus give better support. (6.) If both sutures and strapping are used for a wound, the strips of plaster should lie on the wound between the sutures. (7.) Dipping the strapping into hot carbolic solution makes it lie more smoothly, and, by adapting itself better to any irregularities, allows it to act more efficiently. (8.) In applying the strips of plaster, the edges of the wound should be held together, either by an assistant or by the finger and thumb of the surgeon's left hand, while one end of the strip, held in the right hand, should be laid on the skin at a distance and brought tightly across the wound. (9.) The traction on the strips of plaster should, as a rule, be made from below upwards. (10.) In the removal of strapping, care should be taken not to tear open the edges of the wound, and this is best avoided by raising first one end of the strip as far as the wound, and then the other end in a similar manner, so as to separate last the portion of plaster in connection with the surface of the wound, and thus avoid unduly dragging on either lip of it. (11.) Should the strapping prove too irritating to the patient's skin, as it occasionally does, bringing out a slight papular eruption, then its use had better be discontinued. (12.) After removal of the plaster, should there be any blackening of the skin from the sulphuret of lead sometimes formed between the lead in the plaster and the secretions of the wound, or should any of the plaster remain adherent to the skin, gentle friction with a little carbolic oil will soon remove either of them.

I will now pass to the consideration of *sutures proper*, the

suturae cruentæ of the older surgeons, so called because blood followed the use of the needle by which they were introduced through the tissues, whereas in the *sutura sicca*, or dry suture, there was no bloodshed. And I may here remark that this latter term is not so absurd as might at first sight appear, for this form of suture did not consist of the mere application of a strip of plaster across the face of the wound. It was made by spreading some adhesive plaster on linen having a selvage, and a piece of this being applied along each side of the wound (the selvages being opposed to each other), they were drawn together by sewing them with a common needle. In this way, from the entire absence of bloodshed, the term dry suture arose, and, as it tended to lessen the chance of any scar, it was a good deal used in wounds of the face. With reference, however, to sutures properly so termed, there has always existed a diversity of opinion as to the advisability of using them. Some surgeons have praised them highly, while others have condemned them as injurious and provocative of inflammation. The truth is, each case must be judged on its own merits, as to whether or not it is suitable for stitches; but, as under the antiseptic system there is an entire absence of those mischievous effects often seen to follow the presence of septic threads in the tissues, when putrefaction was present in the wounds, Mr. Lister has unhesitatingly admitted sutures into his method, and they are invariably inserted in proper cases. Even before the introduction of his antiseptic system, Mr. Lister was favourably disposed towards the use of stitches, as the following passage shows:—"Stitches are preferable to strips of adhesive plaster for keeping the edges of the skin in contact, as they occupy much less room, and so oppose less obstacle to the escape of discharge; and the only objection ever urged against them—viz., that they induce inflammation round the points where they are inserted, was entirely removed by the introduction of the metallic suture, which, unlike a silk or linen thread that becomes acrid from putrefaction among its fibres, causes no irritation whatever, unless it subjects the part to traction, and this ought never to be the case after amputation." (Holmes' *System of Surgery*, vol. v, p. 614.) Seeing, then, that the question of the presence or absence of putrefaction in a wound was what controlled the selection of the material to be employed as sutures, it was only to be expected that the antiseptic system, under which wounds and their discharges can be kept with certainty free from putrefaction, would make itself felt in this department of surgery, and would admit the use of substances that, under

ordinary water dressing, would not have been so suitable. And this is what has taken place. In addition to wire, three other substances are employed as sutures in Lister's antiseptic system—viz., silk, catgut, and horse hair, and as each has special features to recommend it, it will be advisable here to say a few words on each of these four materials, before describing the method of using them.

(a.) *Wire Sutures.*—They must not be regarded as a modern discovery, for I find that, in a letter to the *Medical Times and Gazette*, of 22nd January, 1859, Dr. Aveling points out that Fabricius *ab Aquapendente*, writing in the year 1647, alludes to the imperfections of the sutures then in vogue as shown by their exciting irritation, producing discharge, and ulcerating the tissues; and he proposes in their stead iron or brass wire sharpened at one extremity and annealed elsewhere, so that the needle and suture should be really continuous. The passage from Fabricius is given at length in Dr. Aveling's letter. To Fabricius, then, we must award the priority of introducing wire as a suture, but we must not also forget to give the credit that is due in our own country to Mr. Gossett, who, in the year 1834, operated on a case of vesico-vaginal fistula, and closed the aperture with *silver gilt* sutures. (*Lancet*, 29th November, 1834.) This case is also of interest, as the patient was placed for operation in the semi-prone position so much adopted now, and thought to have been first discovered by a well known American surgeon. Leaving out of the question, however, the priority of the introduction of wire sutures, there is no doubt that they owe their present position in surgery to the advocacy of Sir James Simpson in our own country, and Dr. J. Marion Sims in America. The former, by his experiments on animals (the results of which he published), and by his successful employment of them in operations, was instrumental in directing the attention of the profession to the subject, while the latter, by his anniversary discourse before the New York Academy of Medicine, in November 1857, on the subject of "Silver Sutures in Surgery," showed their real practical value, and established confidence in them. Numerous cases were given to show how innocuous they were in the tissues, and that they produced no irritant or poisonous effect whatever, and that, after several days' sojourn in the body, "their removal was like that of a delicate earring from the ear long used to wear it." The experience of surgeons since then has quite borne out the unirritating character of silver wire as a suture; and though the great objection to it is the

difficulty of its removal, yet it is very generally adopted, especially in plastic operations. Mr. Lister says of it:—"I am happy to be able to confirm fully the original statement made on this subject by Dr. Sims, of New York, to whom the profession is indebted for demonstrating the value of the metallic stitch." (*Holmes' System of Surgery*, vol. v., p. 614.) Sir James Simpson recommended "iron wire" for sutures, both for its physical qualities and also its cheapness, the roll of 100 yards only costing 1s.; and at one time it was very much used in Edinburgh, and also in the country, but it has now fallen more into disuse, as the experience of metropolitan and provincial surgeons has been against it, and the silver wire has taken its place. This latter material is of two kinds. There is, first, the pure silver wire, made in three sizes—small, medium, and thick, costing respectively 8d., 10d., and 1s. per yard, or 10s. 6d. per ounce; and then there is another variety, consisting of copper wire plated with silver, and termed "copper silver-plated wire," which is also made in three sizes, and is very much cheaper than the first kind, costing only 6d. an ounce or 1d. per yard for any of the sizes. Some surgeons use the last kind, but it has not the pliability of the pure silver, and from the presence of the copper is liable to oxidation among the tissues, so that the majority of surgeons, and among them Mr. Lister, very properly prefer the variety composed of pure metal as in every way more suitable for sutures. Silver wire is made from ingots of silver, which are shaped into rods by drawing the red hot metal between grooved rollers. These rods are then reduced to the form of wire by being, when cold, drawn by powerful machinery through holes in a plate composed of hardened steel, the holes decreasing in size gradually, and being round, oval, or square, according to the shape desired. To remove the brittleness caused by this great compression, the wire needs frequent annealing or tempering, just as glass does, and, indeed, it is said that silver wire, if kept long, loses its softness and pliability, and becomes unfit for sutures. It may be re-annealed at any time, and, best of all, just before it is required for use. Farther on I will speak of the mode of applying and removing wire sutures, but I would just say here that the wire, though mechanically antiseptic, is rendered aseptic at the moment of application by dipping it and its needle into the carbolic lotion, and inserting the sutures under the spray, just as in the case of the strips of adhesive plaster.

(b) *Carbolised Silk Sutures*.—Admirable as the wire is for certain cases, yet its rigidity, and the fact that all metallic

sutures are apt to catch in the antiseptic dressings, led Mr. Lister to take steps for introducing the ordinary surgical silk into his system, and this he was enabled to do by having the silk *carbolised*, by which process the interstices among the silk are filled up with wax and carbolic acid. Prepared in this way carbolised silk showed itself preferable to cat-gut as "less amenable to absorption," and "very superior to wire, not only on account of its perfect suppleness, but because its actively antiseptic character ensures absence of putrefaction in the track of the stitch." (*Holmes' System of Surgery*, vol. v, p. 623.) Of what, then, is carbolised silk composed? It is ordinary surgical silk impregnated with a mixture of ten parts of bees' wax and one part of carbolic acid. Before describing the mode of preparation, I would briefly allude to the fact that there are several varieties of surgical silk. This silk is specially made for the purpose, and differs from that in the ordinary shops by being pure white, and free from all colouring matter. Silk, in its raw condition, has rather a yellow look, and is somewhat gummy, but this is got rid of by boiling and subjecting it to the action of alkalies, which give it a white appearance. One kind of silk, a good deal used in surgical work, is that known as *purse silk*, which is a strong, evenly-twisted thread, introduced some years ago for netting purses, its recommendations being the perfect regularity of its twist and its strength. There are three sizes of it, course, medium, and fine. More recently, Messrs. Turner & Co. have brought out a modification of this silk, which consists in having it *plaited*, whereby its strength is said to be increased and it loses all tendency to kink or curl as the ordinary silk is apt to do. There are seven sizes of it, but numbers 1, 3, 5, and 7 are the most convenient for every day use, and they are furnished together on a tablet in a sheath. This plaited silk has found a good deal of favour with surgeons on account of the qualities mentioned above, and because of its freedom from all colouring or dressing material. There is one other variety of silk which I must mention, as it has been somewhat extensively used of late, especially by ovariotomists as Keith, Wells, and Thornton. I refer to *Chinese silk*. It is so termed because it is composed of Canton silk, which is one of the lowest class of Chinese silks, and is the variety chosen for making dentists' and surgeons' twist on account of its cheapness—the European silks, such as the Italian or French, being much too expensive for that purpose. There are three sizes of Chinese silk, and they are all characterised by the closeness and firmness with which they are

twisted. It is this that gives them their strength, which is their marked feature. As the basis, then, of his carbolised silk, the surgeon may select any of the above varieties, according to his inclination, for one answers as well as the other, and if he considers the question of expense, he will probably find the difference between the various kinds very small in amount, as they nearly all cost about a shilling per hank of twelve yards.

Mode of preparing Carbolised Silk.—Coming now to the mode of preparing carbolised silk, the first thing to be done is to melt, in a jelly can, ten parts of bees' wax and one part of carbolic acid. Half-an-ounce of the latter and five ounces of the former is a very suitable quantity to employ at one time. The best way of melting these substances is to place the jelly can containing them in a saucepan with some water in it, and let it stand on the hob near the fire. To prevent volatilisation of the acid, cover the jelly can with a piece of sheet lead or stiff paper, perforated with a hole in the centre large enough to allow the silk to pass through. As the melting proceeds, mix the ingredients thoroughly together. Next, wind the hank of silk to be carbolised on a reel, and when the wax and acid are well melted, plunge the reel into the mixture, keeping the end of the silk out and passing it through the hole in the sheet lead or paper from within outwards. After boiling the reel and silk in the mixture for half-an-hour, remove the saucepan from the fire, and proceed to withdraw the now carbolised silk. This is accomplished by grasping the silk with a cloth between the finger and thumb of the left hand, close to the lid on the can, and slowly drawing it through with the right hand. In this way the superfluous wax is removed from the silk, which should then be wound on a fresh reel or plate, and to ensure its retaining its antiseptic property, if kept for any time, it should be wrapped up in a bit of carbolised gauze, or placed in a tightly fitting stoppered bottle. Silk prepared in this way will be found to be quite saturated with carbolised wax, and to possess all the unirritating qualities of wire with the softness and other advantages of silk. Any of the mixture of bees' wax and carbolic acid that may be over can be covered up and kept for future use, as it can be remelted at any time, and thus is always at hand. If necessary, a little fresh carbolic acid can be added on any of these occasions, to replace any lost by volatilisation. Though the preparation of the carbolised silk is neither a difficult nor a lengthy process, yet the surgeon will find it a saving of time to purchase it ready prepared, as it is not a very expensive item. It costs about

1s. 4d. per hank of twelve yards for any size, with a certain percentage off to hospitals. It can be obtained from Mr. Gardiner, 45 South Bridge, Edinburgh, at that price, though I think he keeps prepared only a thick and a thin variety of silk, as being the sizes most generally useful. Should any surgeon desire to prepare the silk for his own use, he can employ either the absolute phenol or the No. 3 acid, but as regards the bees' wax, I would advise him to use the *white* variety. Bees' wax, which is the substance secreted by glands or *wax pockets* placed on the ventral surface of the honey bee, for the construction of the comb in which the honey is stored, occurs in two forms, the yellow and the white. The yellow is got by melting the comb in water, after the removal of the honey, and separating by straining any impurities that may exist; while the white variety is obtained by exposing the yellow kind to moisture, air, and light, and thus bleaching it. The white is the purer of the two, and costs 2s. 6d. per pound, while the other is 1s. 10d. Sometimes the white bees' wax is adulterated with suet, and then it loses the hard feel it ought to possess, and is somewhat unctuous to the touch. Bees' wax is selected for carbolising the silk on account of its blandness, and because it fills up all the interstices of the silk. In its natural condition under the microscope silk presents the appearance of an even cylindrical fibre, destitute of external structure; but the bees' wax actually smooths it down and renders it mechanically less irritating. Further, bees' wax holds the carbolic acid with a certain degree of tenacity, and it is not displaced by blood as soon as the silk is passed through the tissues, as would probably be the case if carbolic oil were used to render it antiseptic.

(c.) *Catgut Sutures*.—These are sutures made of the carbolised gut used for ligatures, and very serviceable they are for cases where they are suitable, but they are very soon absorbed and they will not last beyond a few days. As Mr. Lister says:—"Any one desirous of convincing himself of the absorption of catgut has only to employ it for sutures and treat antiseptically, and in a few days he will find the knots come off with a touch, the part of the stitch embedded in the tissue having disappeared. This circumstance renders the catgut unfit for sutures intended to retain their hold for a considerable period." (*Holmes' System of Surgery*, vol. v., p. 623). It is, however, this power of being absorbed that has given catgut its wide range of utility, especially for uniting deep-seated tissues, where it can be cut short and left undisturbed, the parts above it being allowed to heal. I alluded in my last paper to two

cases of irreducible hernia, treated by Mr. Lister, which illustrate this point, and confirm his statement, "that the catgut stitch becomes a new engine in surgery, enabling us to attach deeply seated parts to each other, leaving the connecting medium to be removed by absorption." (*British Medical Journal*, 26th August, 1871.)

(d.) *Horse Hair Sutures.*—Horse hair, from its length, elasticity, and strength, has long been extensively used in manufacturing a variety of materials where durability and firmness are required, so that it is really an important article of commerce, and large quantities of it are imported from South America. It is of various colours, but black predominates, no doubt from the fact that after importation a great deal of the grey coloured horse hair is dyed a uniformly black colour by means of logwood and copperas. Naturally white horse hair does not admit of being dyed black. It will only take up such colours as green or crimson. Besides varying in colour, horse hair differs much in length. Some of the white hair from the tail of Russian horses is as much as 40 inches in length, possessing great evenness, elasticity, and gloss, while several of the black or grey samples which come into the market are from 20 to 30 inches long. Their length decides the use to which they will be put, the shorter ones going to stuff articles of furniture, and the longer ones being employed for violin bows, and making sieves, fishing lines, hair-cloth, and so on. These qualities of length, toughness, and elasticity, of themselves render horse hair suitable for surgical work, but it has others to recommend it, apart from its cheapness and the facility with which stitches of it can be removed. I refer to the little tendency it has to absorb fluids, and to the smoothness of its surface. Mr. Lister thus alludes to these characteristics of horse hair when speaking of plastic operations on the face. "In operations of this kind, silver wire for the deeper stitches, and horse hair for the superficial ones answer extremely well; the rigidity of the wire enabling it to give valuable support, while both these kinds of material are mechanically antiseptic, since they afford no nidus for putrefactive fermentation in their substance, and both are so smooth in surface, as to be in that respect quite unirritating. For, microscopic examination of horse hair shows that its external epithelium, unlike the imbricated arrangement which prevails in many hairs, such as those of the mouse or of the human head, is so arranged as to produce perfect smoothness, a circumstance which is probably further valuable from the facility with which adhering dust can be removed." (*Lancet*,

5th June, 1875). As to the colour of the horse hair we employ for sutures it is immaterial; but Mr. Lister gives the preference to black, and his reasons for so doing are contained in the following quotation from a lecture given by him on excision of the knee:—"I used white horse hair in this case simply because I did not happen to have at hand any of the black, which is generally preferable, because the individual hairs are thicker, while the dark colour has the advantage of making them more conspicuous, especially when they are used for sutures." (*Lancet*, 5th January, 1878). To render horse hair antiseptic it merely requires soaking for a few minutes in one to twenty carbolic lotion. If placed in some of that lotion at the commencement of an operation it would be quite ready for use when the time for stitching had arrived. Some consider it advisable to remove from the horse hair any grease by steeping it in an alkaline solution, but this is quite as unnecessary as cleansing the skin, previous to an operation, with soap and water followed by ether. The one to twenty lotion will render it perfectly safe as regards freedom from putrefactive agencies. In another paper I hope to describe *antiseptic drainage*, and I shall then speak of the use horse hair is put to as a drain; but, in the meantime, I have said enough to indicate the characteristics which render it useful as a suture. I would only add that the best hairs for surgical work are those from the tail of a stallion, and that, as a rule, horse hair is most satisfactorily obtained from some fishing-tackle maker.

Surgical Needles.—Closely connected with the subject of sutures is that of surgical needles, and it may not be out of place to say a few words here on them, and on the variety best suited for each kind of stitch. Of the various needles in use, those known as Boyer's, Velpeau's, and the Glover's, are the most generally employed. Boyer's needle is curved in the form of an arc of a circle to facilitate its passage through the tissues. It is flattened on one side, with a sharp ridge on the other, and cuts with both edges. Velpeau's is only curved in its lower half, its upper part being straight and rounded. The curved portion is flat on its anterior aspect, and has a sharp ridge posteriorly. The Glover's is a straight round needle, with a bayonet shaped point, which perforates the tissues readily and leaves a small cicatrix. It derives its name from being much used in sewing gloves. With the introduction of metallic sutures it was necessary to make some modification in the needle, so as to prevent the wire, after being passed through the needle's eye, forming a bulky

mass exceeding in thickness the calibre of the needle, for needles should always make a track of sufficient size to allow the suture which they draw to pass through the flesh with the utmost ease. Of the modifications proposed, the three best known are Mr. Price's, Mr. Lister's, and Mr. Murray's. Mr. Price's needle has two eyes and is deeply grooved; Mr. Lister's has one eye passing through from side to side and deeply grooved; while Mr. Murray's has an open end and a groove on the side to admit of the end of the wire being doubled on itself. Mr. Lister's is an excellent needle, and the following is his description of it:—"For passing the wire smoothly through the tissues, a needle suggested by myself some years ago will, I believe, be found the most convenient. It is grooved at each side from the eye to the blunt end, these points being farther from one another than in an ordinary needle. Care must be taken to hold the wire in the grooves while twisting its ends together, after which it will be found securely incorporated with the needle." (Holmes' *System of Surgery*, vol. v, p. 614. Note.) For the passage of the carbolised silk or catgut sutures any of the ordinary needles will suffice, the size and shape of needle selected depending on the calibre of the suture and on the nature and situation of the wound, while for horse hair one of the straight glovers' needles will be found the best. In all of these cases it is as well perhaps to fasten the suture through the eye of the needle by a single knot, as this prevents any slipping of the suture out of the needle when it is being drawn through the tissues. A surgical needle, to be really serviceable, should have a good point and keen sides, and should be sufficiently tempered to prevent its yielding to the force necessary for introducing it. For keeping surgical needles there is nothing better than a bit of chamois leather, or a cushion covered with velvet and stuffed with bran. What blunts needles and takes the point off them is coming into contact with other instruments when lying loosely about.

Having now spoken of the different suture materials employed in the antiseptic system, this brings me to point out the various ways in which they are used. Speaking generally, Mr. Lister may be said to advocate two classes of sutures—viz., *deep* and *superficial*. The latter are used for bringing the actual edges of a wound together, and are sometimes termed *stitches of coaptation*, while the former are for exercising pressure on the tissues in the vicinity of a wound, so as to fill up any gap that may exist and relieve any tension on the superficial sutures, and are called *stitches of relaxation*. These last are often of great service, and their importance was

first pointed out by Professor Simon of Heidelberg, in his important work on *Vesico-vaginal Fistulae*. They may either take the form of button sutures, or be made of silk or wire passed deeply and at a distance through the tissues. For the *stitches of coaptation* we may employ silver, silk, catgut, or horse hair according to the nature of the case. The following table will show the various kinds of sutures:—

(1.) Stitches of Relaxation,	{ (a) Button sutures. (b) Sutures of silver or silk, having a deep and wide hold of the tissues.
(2.) Stitches of Coaptation,	{ (a) Silver. (b) Silk. (c) Catgut. (d) Horse hair.

(a.) *Button Sutures*.—This suture was introduced by Mr. Lister in 1873, and is a modification of the *quilled suture*, founded on the principle of the old shotted suture. His description of it is given in his account of a rodent ulcer of the face treated by excision. It is as follows:—"The eyeball, left bare by the operation, was protected from contact with the dressing by having the loose skin above the upper eyelid drawn down over it by means of the 'button suture,' as I may term a form of 'stitches of relaxation' which I have used for nearly two years with great advantage. It consists of two oval pieces of sheet lead, about one-twentieth of an inch thick, with a central perforation to receive a moderately thick silver wire. The silver wire is first passed as an ordinary suture, except that it is carried at an unusually great distance from the edge of the wound, both as regards surface and depth; each end of the wire is then passed through the hole in the corresponding lead button, and secured by being wound once round the shorter diameter. The two buttons thus take the place of the tips of two fingers of the two hands in giving support to the deeper parts of the wound, while leaving the cutaneous margins entirely free; and when the wound is at all extensive several pairs of buttons are applied in this way, constituting a sort of interrupted quilled suture. By their means the lips of a wound which otherwise could not be got to meet without considerable tension, will often lie in contact of their own accord, any number of superficial sutures being added that may seem desirable to keep the edges of the skin in accurate apposition with a view to primary union." (*Lancet*,

5th June, 1875.) Since the above was written, Mr. Lister has seen fit to modify the shape of the buttons somewhat, and thus describes the change:—"I have for some time past used

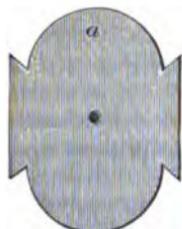


FIG. 1.



FIG. 2.

the lead buttons with a modification of form which makes them better adapted for their purpose. The plate is cut in the shape represented at *a* (Fig. 1), having two wings which are turned up so as to be at an angle of about 45° with the rest of the plate, and round these wings the end of the wire is wound after

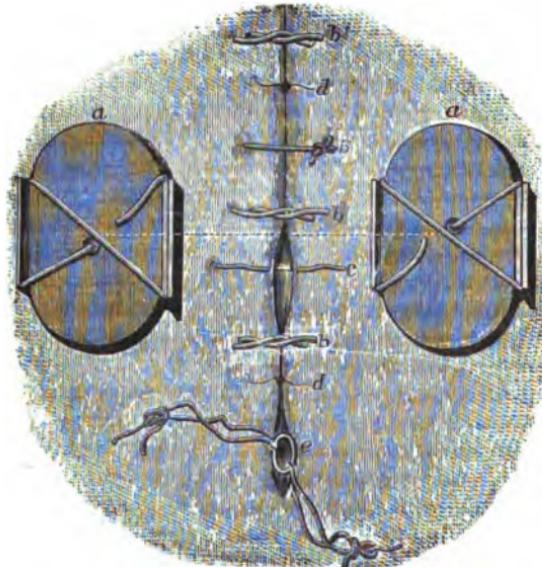


FIG. 3.

passing through the central perforation, as shown at *b* (Fig. 2). This is more readily done and undone than the winding of the wire round the plate as formerly, and at the same time the presence of the wire on the under surface of the plate is

avoided, which by its pressure sometimes gives rise to a linear sore." (*Lancet*, 20th Dec., 1879.)

In the accompanying woodcut, Fig. 3, will be seen a diagrammatic sketch of a wound, showing the buttons *aa* in position, while at *bbbb* are simple relaxation stitches of wire and silk. At *c* is a coaptation stitch of silk untied, and at *dd* are two of horse hair. The dotted line represents the position of the wire of the "button sutures" as it lies deep in the tissues, and *e* is the orifice of a drainage tube placed at the lower angle of the wound.

From Mr. Lister's description of the button sutures, it will be seen that they are of great utility where some force is needed to keep the edges of the wound together and approximate the deeper parts, as where there is any gaping of the wound or where a large raw surface has been left owing to the necessity of removing a considerable quantity of skin, a state of matters often seen after excision of the mamma. In such a case, if the buttons are used of the size depicted in the woodcut, there need be little fear of their causing ulceration, so much is the pressure diffused, and it will be surprising how much traction they may be safely made to exercise. As Mr. Lister says, "Even when the edges of the wound cannot be made to meet at all, the extent of the exposed tissues and consequent granulating surface and cicatrix may be greatly reduced by the use of the button stitches." (*Lancet*, 5th June, 1875). If the case is one where there has been any transplantation of skin to cover in a gap, the only point to be attended to is that in passing the wire see that it does not exercise any harmful pressure on the flap. Mr. Lister thus alludes to this point:—"While it is desirable, with a view to primary union, that the cutaneous margins should be everywhere approximated, it is of vital importance that the base of the flap on which the supply of blood is in the first instance entirely dependent, should be protected from undue tension, or from pressure or traction by button or wire." (*Lancet*, 20th December, 1879). Another advantage that the button sutures possess is, that at any time in the progress of a case they may be slackened or tightened according to the circumstance of the case. Thus, if there was increased traction from inflammatory turgescence, the difficulty, as Mr. Lister says, "is readily got over by unwinding the wire from one of the buttons, and, after straightening it, allowing the button to slip upon it to any degree which the tension disposes it, and then fixing it again by winding the wire round it. And, conversely, if the support of the buttons is still required after they have become slack from any cause, they

can be braced up at pleasure to any requisite degree." (*Lancet*, 5th June, 1875). The time of removal of button sutures must depend on each individual case, but it can be very readily done by untwisting the wire from one of the buttons, pulling it through the aperture, and straightening it out, then, grasping the other button, make traction on it gently, and pull the wire through the tissues.

(b.) *Simple Relaxation Stitches.*—These may be of wire or silk, care being taken, that whatever the suture is, it passes deeply and at some distance from the edges of the wound. In other respects they are inserted just as ordinary interrupted sutures. If they are of wire, a suitable needle must be used, and they may be fixed by a knot or twist, the latter having this advantage that it allows of the stitch being loosened, if needed, without actually taking it out. The drawback to the wire sutures is the pain of removing them, and the risk of tearing open the wound; but if the removal is done in a proper way, the pain and risk are much diminished. Of the various ways suggested, I think the best is the one I used to see Mr. Lister adopt. His plan was to seize the knot or twist with a pair of dissecting forceps held in the left hand, and with fine pointed scissors he cut the wire to the right of the knot. The next thing was to convert the circle of the wire into a semi-circle by straightening out the wire as much as possible. This was done by seizing the cut end of the wire in the point of the scissors, and the knot in the forceps, and by rotating each outwards the two ends were separated, the one from the other. Each end being then cut off close to the skin, the portion remaining in the tissues was removed by the forceps by making it describe a slight curve in its exit, corresponding to the altered shape of the wire. When silk is used, it is passed just as the wire is in the form of the *interrupted suture*, the thread being cut after each stitch and the ends tied together in a reef knot, the knot being placed *rather on one side of the line of incision*, so as not to interfere with the lips of the wound being brought closely together. The silk stitches are easily removed by dividing the thread with sharp pointed scissors on one side of the knot, which may then be seized by the forceps, and withdrawn gently. The time of removal must depend on each individual case, and on the presence or absence of any ulceration of the tissues.

(c.) *Caopatation Stitches.*—These stitches may be of fine silver wire, catgut, silk, or horse hair, and they are inserted with the view of keeping the edges in accurate contact so as to insure primary union. Of the above materials I have always found

the catgut and horse hair answer admirably, and in plastic operations on the face, where the mucous membrane and skin may require stitching together, as at the lips, the latter is most serviceable. A glover's needle works very well with these stitches, and it should pass through the whole thickness of the integument, entering about one-eighth of an inch from the edges of the wound. As to the distance between the sutures, that must rest with each case, but when the sutures are tied, the knots should fall, if possible, rather to one side of the incision. In the case of horse hair, to prevent any slipping before the final knot is tied, it is as well to make the first knot a *surgeon's* one, which is done by twisting one end of the suture twice round the other end instead of once. Lastly, I would add that of course all needles and sutures must be duly purified by dipping them into carbolic lotion, and that the spray must be working the whole time they are being inserted. Mr. Lister is most emphatic on this point:—"The spray is never more useful than in the introduction of sutures. If it be not employed, the wound must be injected with lotion after the insertion of the last stitch, to destroy any mischief that may have entered through regurgitation of blood that oozes into the cavity during the sewing—a troublesome and uncertain process, which the spray enables us to dispense with entirely." (Holmes' *System of Surgery*, vol. v, p. 623).

To recapitulate, then, in conclusion, I would direct attention to the following points:—

- (1.) Ordinary adhesive plaster may be used in Lister's system for keeping the edges of wounds together.
- (2.) To render it *antiseptic* it must be dipped before application into warm carbolic lotion.
- (3.) After it has been applied care must be taken to see that the gauze dressing well overlaps the ends of it.
- (4.) The materials used for sutures in Lister's system are silver wire, carbolised silk, carbolised catgut, and horse hair.
- (5.) Silver wire and horse hair are mechanically antiseptic, but are freed from all septic agencies that may adhere to them by dipping them into carbolic lotion just before using them.
- (6.) Ordinary surgical silk can be carbolised by steeping it in a mixture of bees' wax and carbolic acid, but it is advisable to dip it into the carbolic lotion just before it is used.
- (7.) The carbolised catgut for sutures is the same as that employed for ligatures.
- (8.) Antiseptic sutures may be divided into *stitches of relaxation* and *stitches of coaptation*.
- (9.) *Stitches of relaxation* are used for making pressure on

the deeper tissues near the wound, and thus approximating its edges.

(10.) *Stitches of coaptation* are inserted to bring the edges of the wound into accurate union.

(11.) The “button suture” is of great value as a stitch of relaxation.

(12.) It is essential that all stitches should be inserted under the spray.

(To be Continued.)

RENAL EPILEPSY OCCURRING IN PARTURIENT WOMEN.

By EBEN. DUNCAN, M.D., Crosshill, Glasgow.

IT has been attempted by various obstetrical writers to limit the application of the term puerperal convulsion to a particular class of cases having a special pathology, and to look upon all other cases of epileptiform seizures, which occur during pregnancy, as rare exceptions not entitled to the name puerperal. The class of convulsive diseases, which individual writers have decided to treat of as distinctly puerperal, has varied according to the experience of the writer. This method of describing puerperal convulsions as a separate entity has led to great confusion, and to a great deal of fruitless controversy as to the etiology, pathology, and treatment of a group of diseases, which are only similar in name and in certain external manifestations.

It is not only true that all the varied conditions which produce epileptiform phenomena in non-pregnant persons may produce convulsive seizures in pregnant women, but there is some reason to suppose that a degree of any one of these pathological conditions, which would not seriously affect the non-pregnant person, might disastrously affect a pregnant woman. When a woman approaches the end of her term of pregnancy, the great supply of nerve force, which is required for the emergencies of labour, has been gradually stored up by increased nutritive changes in the grey matter of the nerve centres, and the irritability of these centres may thereby be so greatly increased that a slight degree of peripheral irritation or a slight form of disease, leading to imperfect elimination

of effete matter or to specific blood poisoning, may readily lead to a misdirected explosion of this accumulated nerve force.

These considerations should lead us to discard entirely the fallacy of looking upon puerperal convulsions as a separate entity which must depend on a particular pathological condition such as uræmia, and to exercise the greatest care in investigating every case irrespective of the fact that it has occurred in a parturient woman. There is one point in the diagnosis of this class of diseases which has a special bearing on the cases which form the subject of this paper, and which it is therefore necessary that I should specially refer to. The discovery of albumen in the urine of a woman who has had several epileptiform convulsions is not necessarily evidence of uræmia. It has been proved that the convulsion is sometimes followed by a temporary albuminuria—the albuminuria being the effect and not the cause of the fits.

It was recently asserted by Dr. Bourneville that uræmia, as a cause of convulsions in parturient women, could be distinguished from other causes by the temperature of the patient. He asserted that, in uræmic convulsions, the temperature never rose above the normal rate, and was frequently found to be a degree or even two degrees lower. Whereas, in convulsions arising in puerperal women from peripheral irritation and other causes, to which cases he was disposed to limit the name puerperal convulsions, the temperature indicated fever.

I have not met with any published records of the range of temperature in uræmic convulsions, but I had recently an opportunity of making observations in such a case. A young gentleman, aged 19, who had been suffering for some weeks from a kidney affection which had led to albuminuria, general anasarca, and oedema of the bases of both lungs, was suddenly seized with epileptiform convulsions. His temperature had been noted for some days before the attack as normal. He had had two fits before I saw him, and when I visited him he was deeply comatose. His temperature was then 102° F. The fits recurred frequently, and the temperature gradually rose to 103°. He was treated by the administration of purgatives, by bleeding, and by repeated doses of chloral. After two days diuresis set in, he recovered consciousness, and his temperature fell to the normal rate. This patient was seen by Dr. Finlayson during the period of the rise in temperature which accompanied the fits.

I have also taken records of the temperature, during several days of uræmic coma which ended fatally, in two cases of

advanced kidney disease. In both cases the temperature ranged from 99° to 101°. These observations lead me to doubt the value of Dr. Bourneville's new method of diagnosis. Having made these preliminary remarks, I shall now detail two cases of sudden congestion of the kidney which I would not have expected to bring on uræmic convulsions in the case of a non-pregnant woman, but having occurred in women who had arrived at the full term of pregnancy sufficed to bring about a sudden discharge of the nerve force and misdirected its energies. In these cases the muscular spasms, so induced, tended constantly to increase the stasis of blood in the kidney by obstructing the circulation in the veins; and so every new convulsive seizure led to greater difficulty and danger. In order to avoid the name puerperal convulsion, which has given rise to so much controversy in the past, and, to distinguish them from the ordinary form of uræmic convulsions, I have chosen to call them cases of renal epilepsy occurring in parturient women.

CASE I. On the 7th of March, 1872, I was called to visit Mrs. M., a young lady, æt. 25, who had reached the full term of her first pregnancy. I saw her at 12 noon, and found her in a condition of violent epileptiform convulsions. The convulsions were general, the face was livid, the teeth clenched, and a bloody foam issued from the mouth. The pulse was full and slow, and the breathing stertorous. She was a short, stout, florid, woman, who, I was informed, had always enjoyed good health up to the time of this seizure. I learned that she had had several convulsive seizures at short intervals before my arrival, and had not been conscious for some time. She had not previously suffered from epilepsy. I drew off a small quantity of urine from the bladder and found that it became almost solid on boiling. I bled her from the arm to the extent of 15 ounces, and as she had lost the power of swallowing, I placed 2 drops of croton oil upon the back of the tongue. The action of the bowels was hastened by an enema of castor oil and turpentine; sinapisms were applied to the calves of the legs and along the spine, and, as the convulsions continued to recur at frequent intervals during the afternoon, I administered chloroform to full anæsthesia; the convulsions were immediately arrested, and from 5 P.M. there was no recurrence of these seizures. She was carefully watched during the night. On visiting her next morning, I found her quite conscious. I was told that she had slept continuously during the night. I again examined the urine and found it still highly albuminous. A poultice of mustard

and lintseed was ordered to be applied over the region of the kidneys, and a diuretic mixture was prescribed, containing full doses of acetate of potash. Labour came on naturally about 4 o'clock in the afternoon. The head presented in the first position, and labour terminated naturally about 9 P.M. in the birth of a living healthy looking male child. The placenta was expelled five minutes after the birth. The uterus contracted firmly and the discharge was moderate. The patient was very cheerful, laughing and talking to the nurse. The only cause for anxiety which remained was a preternaturally rapid pulse. After such an easy natural labour, lasting only 5 hours, I expected the pulse to fall in the usual manner, but it continued weak and rapid, 120 per minute. I waited for an hour, during which the condition of the patient continued unchanged, then, as my house was in the immediate vicinity, I went home, leaving instructions with the nurse to sit up with the patient, watch her carefully, and send for me at once if any danger arose. Unhappily the woman deserted her post. She lived in an adjoining house, and went home about 11 o'clock, stating that she would return in a short time. Meanwhile, the husband was left alone in the house in charge of the patient. The convulsions returned about half-past eleven. The poor man could not leave his wife in such a plight. The nurse did not return till nearly twelve. The husband then came for me. When I arrived at the house a few minutes after midnight, I found that my patient had died as I entered the door. Next day, with the assistance of Dr. M'Kim, I made a *post-mortem* examination of the body, I examined all the organs with the exception of the spinal cord, and the only disease I could discover to account for the malady, was congestion of the kidneys. I have no doubt that she died from asphyxia, the result of continued spasms of the respiratory muscles.

CASE II. On the evening of the 4th of March, 1877, I was called to see Mrs. T., a lady aged 28, who had completed the eighth month of her third pregnancy. She was suffering from severe pain in the epigastrium, and violent vomiting of bilious-looking matter. She stated that she had been in her usual health up till that evening, that this illness had come on suddenly, and without any cause that she knew of. I prescribed a sedative mixture, and a sinapism over the epigastrium. On visiting her next morning, I found that the pain and vomiting had subsided. She stated that she had slept well during the night, and now felt quite well.

About 8 P.M. I received a note from her husband asking me

to come to see her at once, as she was in a convulsive fit. On arriving at the house I was told that she was just coming out of a seizure. Her husband informed me that she had kept her bed during the day, and complained of feeling nervous. At half-past six o'clock she took her tea as usual, sitting up in bed, but shortly thereafter she complained of dimness of sight, and then of headache. Suddenly, but without any cry or exclamation, she fell on her side and went into convulsions. The convulsions affected the whole body, but her husband noticed that the left side was more violently convulsed than the right. This seizure lasted about 10 minutes. When she recovered she did not know that anything had happened her, but still complained of blindness, headache, and, in addition, of soreness of the tongue. Half-an-hour elapsed when she had a second seizure similar to the first, and lasting about the same time. On recovery, she inquired what was wrong, and kept crying out "Oh my head!" She also complained of the soreness of her tongue. The third attack took place about 8 o'clock, and she was just recovering from this seizure when I arrived. I found her in a confused, somewhat hysterical, condition. She complained of headache and blindness. Her tongue had been severely bitten, and was much swollen. On examination I found no evidence of labour. I drew off some urine from the bladder, and, on boiling, it became almost solid. I administered an enema of castor oil with turpentine, and applied a sinapism along the spine. Shortly after the application of the mustard she was again seized with a violent epileptiform convulsion, her face became extremely livid, and her breathing stertorous. I administered chloroform, which arrested the fit in a few minutes, but from this time she did not recover consciousness. Her pupils remained insensible to light, and she lost the power of swallowing. As her pulse continued full and slow I bled her from the arm to the extent of 12 ounces. During the bleeding she had a return of the convulsions, but, as the bleeding continued, the spasms became less severe, the pulse softer, and the breathing quieter, but she still continued deeply comatose. As the enema formerly administered had cleared out the lower bowel, I injected into the rectum 3*i* of chloral, dissolved in 2 ounces of water, which was retained. Sinapisms were applied to the calves of the legs. In spite of these active measures, the convulsive seizures continued at irregular intervals, averaging 20 minutes. Just before the commencement of the paroxysm, the patient became restless, and the pulse quickened. When this happened I immediately began the administration of

chloroform, and, although this did not always prevent the seizure, it modified and sometimes abated the attack. At 2 A.M., as there was no improvement in the patient's condition, and no appearance of uterine action, I determined to induce premature labour, and sent for the assistance of my neighbour, Dr. Brown, of Mount Florida, to whom I am much indebted for his valuable help in the subsequent treatment of the case. Dr. Brown agreed with me that it was advisable to induce labour. We determined first to try the effect of a flexible catheter, introduced in the usual manner between the membranes and the uterine wall. We adopted this method because in puerperal eclampsia the uterus is usually in a very irritable condition and ready to expel its contents. We hoped that this might be sufficient to set up speedy uterine action. I introduced the catheter at 4 A.M. At 5 A.M., although there was no distinct evidence of labour, the os was found to be slightly patent, soft, and dilatable, and the head presented in the first position. The convulsive seizures continued to recur at short intervals, and the coma seemed to deepen. Having put the patient fully under the influence of chloroform, I introduced the smallest size of Dr. Barnes' uterine dilators, and proceeded to dilate the os, using afterwards the two larger sizes. Without any difficulty the os was in this manner nearly fully dilated within half-an-hour. The patient being kept under the influence of chloroform during that time. The membranes were then ruptured. Natural uterine contraction came on immediately, and within an hour the head was found to be pressing against the perinæum. Patient was again put under the influence of chloroform, and the labour was terminated at 7 A.M. by means of the forceps, and resulted in the birth of a dead child, which was small, and presented the usual appearances of a child born in the eighth month of utero-gestation. From the introduction of the catheter to the delivery by the forceps the labour occupied three hours. After her delivery the patient improved. The convulsions continued, but became less frequent and less severe, occurring at intervals of an hour. She continued insensible, but the breathing became quieter, and the power of swallowing was recovered. At 8 A.M. the pulse was 120, temperature 101°, and respiration 24. The bladder was relieved by the catheter, and the urine was found to be rather less loaded with albumen. A powder of 5 grains of calomel, with 5 grains of scammony was administered, which acted freely in the course of the forenoon. She was fed at intervals with beef tea and milk. Dr. Brown kindly took charge of the

patient during this day. The convulsive seizures continued at intervals of about an hour up till 2 P.M. At that hour the temperature being 101° and pulse 120, Dr. Brown enveloped the body of the patient in a wet pack, in order to induce diaphoresis, and so still further relieve the congested kidneys. She remained in the pack two hours, during which there was no return of the convulsions. But the seizure recurred immediately after her removal from the wet blanket. At this time it was ascertained that the patient's temperature had risen to 104·4°, the pulse to 160, and the respiration to 32 per minute. The fit, however, did not return for four hours. At 8·30 P.M. the temperature had fallen to 102·8° and the pulse to 120.

At 11 P.M. Dr. Leishman saw the patient, and on hearing the history concurred in what had been done, and gave a favourable prognosis. He recommended 30 grain doses of chloral. During his visit a convulsion occurred, and another seizure within half-an-hour. At twelve o'clock 30 grains of chloral were administered, and, as I considered it necessary to have the patient under medical supervision during the night, I left her in charge of Dr. Napier, who administered a second dose of 30 grains of chloral at 1 a.m. The patient then fell asleep, and the convulsions did not return. Next morning (March 6th), I visited her at 8 A.M., and found her conscious. Temperature 100·2°, pulse 100. She complained of general soreness, and of the pain of her tongue. I drew off about 10 ounces of urine, and found that the albumen was not nearly so abundant. This urine was examined microscopically, and found to contain numerous tube casts, which presented fat globules. Dry cupping was effected by means of four small tumblers applied over the region of the kidneys, and a diuretic mixture was prescribed, containing full doses of acetate of potash, with 10 grains of benzoic acid to each dose. From this time she steadily improved, the albumen gradually lessened in quantity, and within a week had entirely disappeared. The only other fact in connection with this case worthy of mention is that on the day following her recovery to consciousness she had peculiar delusions with regard to her husband, and as her temperature had somewhat increased, I began to fear an attack of mania, which is a well-known but rather rare sequela of puerperal eclampsia. On the following day, however, the delusions were gone. They did not recur, and she is now in good health.

The treatment of renal epilepsy occurring in young robust women must be prompt and energetic. Every successive attack of convulsions increases the congestion of the kidneys,

and tends to produce congestion of the brain. The tendency is to death, either by spasm of the respiratory muscles or by apoplectic effusion. When called to such a case, during an epileptiform attack, the physician should administer chloroform in order to avert the danger of death by asphyxia; and if the patient's pulse be full and strong, she should be bled from the arm to the extent of 12 or 15 ounces. I have been convinced, by repeated observation of such treatment in various forms of acute organic congestion occurring in otherwise healthy persons, that moderate venesection is not only free from any evil results, but is more speedily and certainly followed by good results than any other remedy which can be suggested. Hydrate of chloral should also be administered in all such cases, either by the mouth or by the rectum, in order to keep up a continuous soothing action upon the excited nerve centres. It may be repeated in doses of 30 grains every two hours if necessary. Even in epilepsy proper, I have found that chloral succeeds in controlling these sudden explosions of nerve force when bromide of potassium and other remedies have utterly failed. If labour does not occur spontaneously, and if the convulsions recur in spite of these remedies, I believe it is necessary to evacuate the uterus as speedily as can be safely accomplished. Barnes' bags are a most valuable means of dilating the os uteri, which I have repeatedly had recourse to in various emergencies. I have found by experience that the gum elastic uterine tube used with the syringe for the injection of perchloride of iron, is the best instrument for placing these bags in position and retaining them within the os during their subsequent distension. When the os is fully dilated and the membranes ruptured, the application of the forceps is usually devoid of danger. The means which may be necessary to hasten labour must vary according to the circumstances of mother and foetus. It is essential to the safety of the patient that she should be put fully under the influence of chloroform before any such obstetric operation is attempted, otherwise the irritation of the uterine and vaginal nerves so produced may, by their reflex action, give rise to a fresh epileptiform seizure.

When the immediate danger of the convulsions is combated, we must endeavour by every means to promote the excreting power of the kidneys, and to assist these organs by acting freely upon the bowels and skin. I have found as a matter of experience that benzoic acid, combined with a saline diuretic such as acetate of potash, promotes greater diuresis than either of these remedies when administered alone. It was introduced

into practice as a means of neutralising the carbonate of ammonia which, until lately, was erroneously supposed to exist in excessive quantity in the blood of uræmic patients. I still believe it to be a valuable remedy in these cases on account of its diuretic action.

In conclusion, in such puerperal cases, until the kidneys have been got to act freely, and the patient's general condition is quite satisfactory, I would urge the importance of having her constantly under the supervision of some one who is capable of giving chloroform, and, if necessary, using other means, to prevent the calamity which happened to my first patient. Her life, I firmly believe, might have been saved by the timely administration of remedies.

ULCERATION OF THE SCALP.

BY E. D. MACKELLAR, M.B., POONA.

ALTHOUGH sloughing wounds and more or less malignant ulcers of the scalp are sufficiently common in Europe, large simple ulcers are not of frequent occurrence. In India, however, feeble and destitute people, both adults and children, suffer considerably from severe and extensive ulceration, not confined to the lower extremities, though more common on them than elsewhere, but often affecting large portions of the head. The fact of the head being affected is easily explained by the climate and the habits of the people. During the heat of the day the poor often sleep by the roadside, or in resting places not unlike cattle sheds, and those who do not possess a cloth big enough to cover their bodies are almost entirely exposed to the dust and insects. The misery of such a condition can be easily imagined, if it be remembered that the temperature is above 90° F., and that no rain may have fallen for months. Any small boils on the scalp are either entirely neglected, or merely covered from time to time with a sort of plaster made of leaves and charcoal beaten up together, which succeeds in matting the hair and confining the discharge. After a few days the sore is further aggravated by the presence of maggots. As men usually shave their heads or cut their hair very short, they are less affected than women. As the three cases about to be described were examined after death, they will illustrate the condition of the brain in cases of severe ulceration not caused by injury.

About the same time two women were admitted into one of the Famine Relief Camps, suffering from round deep ulcers situated on the vertex. The sores were about the size of half-a-crown. In addition to the affection of the scalp, the women suffered from general debility. On account of the nature of the accommodation afforded, these two cases could not be entirely separated from other inmates who were suffering from gangrenous and sloughing sores. The ulcers gradually became deeper and larger till they reached the calvarium, and finally the entire vertex was exposed, the bare bone being surrounded by a gangrenous margin of scalp. Beyond the actual phagedenic border of the sore the rest of the scalp, though possessing considerable vitality, was to a large extent separated from the underlying skull. There was never much discharge. About a month after admission the patients died. The autopsies were made about ten hours after death, before putrefactive changes had begun. As the cases were so similar, one description will answer for both. The scalp was found to be even more extensively separated from the calvarium than had been suspected during life. When the calvarium was removed, the dura mater corresponding to the area of bone exposed at the bottom of the ulcer, and for some way beyond it, was detached and anaemic. In other parts the amount of adhesion was normal, but there was unusual hyperæmia. The portion of dura mater corresponding to the exposed bone had a gangrenous odour, but there was no pus lying free between the bone and the membrane. The longitudinal and lateral sinuses were filled with clot, semi-purulent in the neighbourhood of the detached dura mater, but elsewhere normal in appearance. The whole of the upper surface and lateral portions of the brain were covered with soft and semi-purulent lymph. The brain substance presented nothing abnormal. The body was examined, but no signs of embolism or pyæmic abscesses were found.

The third case was that of a female child about 10 or 12 years of age. On admission there was a small ulcer on the one side of and rather behind the vertex. Like the others it contained maggots. The sore spread till a piece of bone larger than a shilling was exposed, while the margins were becoming more and more undermined. From this time particular attention was directed to this case, and the sore began to improve gradually, the edges became adherent round the margin of a circular portion of the outer table of the skull, which was being by degrees elevated and removed by granulations springing from the subjacent diploe. The

child rapidly improved in general condition, and became quite fat and strong, though she had been much emaciated on admission. On the morning visit, about three months after the patient had been received into the Relief Camp, information was given that she had died suddenly during the night, after having vomited a large quantity of blood. As dysenteric ulceration of the bowel was extremely frequent, and was nearly always accompanied by punctiform ulceration of the stomach, the latter was first examined, under the idea that the cause of death might have been a large and acute gastric ulcer. The stomach presented nothing unusual, except a few blood clots of very dark colour. When the calvarium was removed, the dura mater was found to be hyperæmic, but not extensively detached. One small portion of bone, however, corresponding to the line of the longitudinal sinus, was necrosed—a rather peculiar fact, as it did not lie below but rather to the one side of the bone exposed externally. The dura mater, which had become detached from the necrosed piece of the inner table of the skull, was softened, and appeared to have become perforated at one small point. If this perforation actually took place during life, and was not caused in the removal of the calvarium, no blood at least had escaped, or if any had escaped the perforation must have been of long standing and the blood had been absorbed. The longitudinal sinus was filled for some little distance with clot, which was semi-purulent near the seat of perforation, the dura mater having given way at the part forming the roof of the longitudinal sinus. The membranes and brain were in other respects normal. Before incision the lungs appeared to present nothing unusual, but, when the right one was cut into, a cavity about the size of a pigeon's egg, full of recent blood clot, was found. It was crossed in different directions by ramifications of the pulmonary vessels and bronchial tubes, the parenchyma alone having given way before the pressure of the effused blood. The cavity was surrounded by a hyperæmic zone. In other respects the lung was normal. It seems probable that a clot from the longitudinal sinus plugged a branch of the pulmonary artery, and that a rupture was caused by increased pressure and irritation. The parts did not present the appearance of a circumscribed pneumonia. The supposition that the vessel gave way is reasonable, as fatty degeneration of the vascular system was extremely common among the people receiving Famine Relief. It is strange that the patient who had least vascular disturbance locally was the one to suffer in an organ somewhat remote.

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Chirurgie Antiseptique, Principes, Modes d'Application et Resultats du Pansement de Lister. Par le DR. JUST LUCAS-CHAMPIONNIÈRE, Chirurgien de la Maternité de l'Hôpital Cochin, &c., &c. Paris: Baillière et Fils. 1880.

Antiseptic Surgery. By WM. MACCORMAC, M.A., F.R.C.S.E.&I., Surgeon and Lecturer on Surgery, St. Thomas' Hospital, &c. London: Smith, Elder & Co. 1880.

If the claims of Lister's antiseptic system have been too much ignored or depreciated in the past, recent events show that there is springing up a very general desire on the part of the profession to make full amends for any indifference or neglect that may have at first been shown towards it, and, by giving it a fair trial, to allow it to stand or fall by its own merits. The appearance of the three publications mentioned above is evidence of this feeling, and of the extent to which the system is being adopted; and, as they are indicative of the present state of opinion upon this question in Germany, France, and England, we have thought that it would be instructive to take them up together, and compare the views and teaching which they contain.

The first of the above treatises on antiseptic surgery proceeds from the pen of Professor Nussbaum, who occupies the Chair of Clinical Surgery in the University of Munich. It is really the second edition of a small brochure, published two years ago under the title of *Clinical Surgery at Munich in 1875*, which was soon out of print. As it was often asked for it has been brought out in its present form, and in the French translation extends to 180 pages. It is devoted entirely to an exposition of Lister's system of dressing wounds; and the contents are arranged under four heads:—(1.) A consideration of the question as to whether or not the antiseptic system should be adopted by surgeons. (2.) An account of the materials of Lister's system. (3.) Directions as to the method of employing these materials; and (4.) A short discussion as to the applicability of Lister's system to military surgery in time of war.

It is in dealing with the question as to whether or not the antiseptic system of Lister should be universally adopted by surgeons that Professor Nussbaum brings to light many facts that must prove of great interest to all. He answers the question distinctly in the affirmative, and the position he takes up is this, that if he can show that the antiseptic system is better than any of the other plans in vogue for treating wounds, then every surgeon is bound to follow it; for it is a rule, without an exception, that a medical man, when treating a case, is in duty bound to follow the means that he knows are the best. By what standards or tests, then, are you to judge of a method of treating wounds? Nussbaum considers that the proper way to form an opinion is by the frequency of the accidental complications which follow wounds treated by it, such as pyæmia, hospital gangrene, erysipelas, lymphangitis, and disorders of that nature. Taking the presence or absence of these disorders as a criterion of the merits of the dressing, what has been Nussbaum's experience? It has been of such a nature as to make every reflecting surgeon ponder deeply the lesson brought out. He tells us that his acquaintance with the clinical wards at Munich ranges over a period of about twenty-three years. During the first eighteen of them, pyæmia was constantly present, attacking all the compound fractures, and nearly all the amputations, and this in spite of every precaution taken as to cleanliness and matters of hygiene. This state of matters was varied by attacks of hospital gangrene and erysipelas, there being a special outbreak of the former in the year 1874, when as many as 80 per cent of the cases of wounds in the hospital were attacked, and the unhealthiness of the place was shown by the deaths which occurred in cases of a very slight and trivial nature. Such a thing as union by first intention was unknown, and to such a pass had things come that surgeons asked whether it was right to operate in such an infected building. Nussbaum himself set on foot a movement for erecting a new hospital, and did all his operations in his private hospital some little distance out of the town. At last, in 1875, it was determined to give Lister's system a proper and fair trial, and to carry it out in every case, trivial or severe. This was done, and what was the consequence? That in this same building, which for thirty years had never been free from pyæmia, erysipelas, hospital gangrene, and other surgical complications, there has not been since then a single case of these diseases. And not only that, but compound frac-

tures consolidate rapidly and firmly, amputations and plastic operations heal by first intention, and the death-rate of the hospital has fallen to the half of what it was. Such results cannot be ascribed to chance, for they date clearly from the introduction of the new system of dressing wounds; nor can they be due to other influences, for the wards themselves are unchanged. They hold the same number of patients, and the same system of nursing and the same scale of diet are in vogue as before. Under these circumstances, Nussbaum claims that to Lister's antiseptic system must be awarded the credit of the improved state of matters which has sprung into existence along with its introduction, and in this view we think he will be supported by all unprejudiced minds. He thinks, too, that, after such a demonstration as this, no surgeon can conscientiously ignore Lister's system, or act fairly towards his patients until he has thoroughly acquired it. In this chapter, too, the author expresses himself as a firm believer in the germ theory, and that he prefers Lister's antiseptic system to any of the others that have been brought forward.

The section of the book which treats of the materials used in Lister's system is correctly and concisely written, and is fairly well up to date. The description, too, of the method of applying the dressings shows that the writer fully understands the principles upon which the system is carried on, and is alive to the necessity of the careful attention to detail which Mr. Lister inculcates. In fact, Nussbaum and his German brethren are apt to exceed Mr. Lister himself in this matter. Thus, they are not satisfied with cleansing the skin previous to an operation with carbolic acid alone, but they use in addition ether and soap and water, so as to ensure perfect cleanliness. This desire to fail in none of the minutiae of the system is no doubt the cause of the great success the Germans have attained, and Nussbaum holds with Volkmann that the best results are always got by those who are most rigid in carrying out details, and that where there have been complaints against the method we may be sure that the execution of it has been faulty, incorrect, and incomplete. He frankly admits that at first he himself regarded all the minute precautions insisted on as absurd and ludicrous, but he was soon convinced, by a few failures, of their necessity, and now no one can speak more strongly than he does on the difference which exists between *using Lister's dressings* and *carrying out Lister's system*. To accomplish this latter point Nussbaum would have all remember that at first they may expect failures, but that practice and care will soon make them adepts, and he

illustrates this by alluding to a fact pointed out by Volkmann, and to which, we think, Mr. Lister has himself drawn attention, that in hospital work more antiseptic cases go wrong at the commencement of a session, when the dressers are new to their work, than at the close, when they have become expert in the application of the dressings, and have had their faults drilled out of them.

Space does not permit us to do more than say that the surgical cases quoted throughout the work embrace a wide range of diseases and injuries, several of them being of great interest. In some of the cases which were septic on admission to hospital, and where the attempt was made to render them aseptic, it is encouraging to note that success followed, even after the lapse of several days from the receipt of the injury or wound.

In the concluding chapter of his book Nussbaum discusses the question whether the antiseptic method could be made applicable in time of war, and after a careful consideration of the subject he thinks that it can. His plan of procedure would be to close each wound immediately by *an antiseptic tampon*, and then subsequently to carry out Lister's system with all its details at the field station hospital. The tampon he recommends is one of salicylic wadding or jute, enclosed in a bit of salicylic gauze, which he would have served out to each soldier as part of his equipment. Salicylic acid is selected because of its non-volatility, which allows of its being dissolved in the serum of the blood, and being taken up by the surrounding tissues. In this way it makes its antiseptic influence felt in the vicinity and recesses of the wound. In support of these views he quotes the experience of surgeons in the late Russo-Turkish war, which goes to confirm all that he advances.

Some remarks on carbolism and carbolic eczema, together with a list of conclusions drawn from his personal experience of antiseptic dressings, complete the contents of Professor Nussbaum's work, which, though of small compass, may fairly claim to represent antiseptic surgery as taught by Mr. Lister, and which will always possess an interest of its own, as being the publication that, more than any other, influenced German surgeons in making trial of that method in treating wounds.

Passing next to the work of Dr. Lucas-Championnière, we find that it also is the production of a firm believer in the germ theory, and not a recent convert, but a strong supporter of Mr. Lister from the very earliest period of his labours in behalf of antiseptic surgery. The present volume is the second

edition of a smaller work, which was published with the object of making known in France the principles of Lister's method, and was very favourably received. This new edition has larger aims. In it the author is desirous to demonstrate more in detail the *practice* of the system, and to make better known the great advantages of it, of the value of which considerable clinical experience has convinced him. Accordingly, he has gone in largely for reports of cases, and we have chapters on all the chief operations of surgery, such as amputations, excisions, osteotomy, radical cure of hernia, ovariotomy, trephining, and many others. In the suggestions made as to the mode of procedure to be adopted in carrying out the treatment of these cases antiseptically, it is at once evident that Dr. Lucas-Championnière is writing on a subject in which he is well versed, and that he thoroughly understands Lister's system. And he seems to have followed the right course to become acquainted with it, for as far back as the year 1868, when it was quite in its infancy, he tells us that he visited Glasgow to see the method for himself, while in 1875 he made a lengthy stay in Edinburgh to perfect himself in it and in the many improvements that had taken place in the means adopted for carrying it out. His book shows how well he profited by his visits, and what a great advantage it is to pay a personal visit to Mr. Lister's wards, and, if possible, see him carry out his method.

In a review such as this, it would be impossible to deal with the book chapter by chapter, but we may say that of the thirty-four chapters into which it is divided, each one takes up the consideration of some particular subject connected with the system, and there are few points that are not touched on. The effect of Lister's method on the salubrity of a hospital, a consideration of the objections urged against it, and many other such matters, are fully and impartially discussed. The author speaks with no uncertain sound when he gives his experience of wounds treated by the antiseptic system. He finds that there is an entire absence of subsequent complications; that the healing process goes on with remarkable certainty; that there is freedom from suppuration; that union by first intention is of frequent occurrence; that the cure of cases is unusually rapid; and that operations formerly held dangerous or even unjustifiable are now not only possible but safe. Under these circumstances it is not to be wondered at that he strongly supports a plan of treatment which confers such advantages as these.

The chapters taken up with a description of Lister's anti-

septic materials are most correct and complete, and embody all the most recent alterations and improvements. The illustrations throughout the book are drawn with great clearness, and are well executed. A tolerably full list of the literature of antiseptic surgery is given at the end of the volume, and adds considerably to its value. On the whole, we must congratulate the author on the appearance of the present edition of his work, of which we cannot speak too highly. Written in a clear, but concise style, it embodies in one volume of moderate size a correct exposition of the theory and practice of Lister's system, a knowledge of which it must materially help to spread abroad in France as well as elsewhere.

The last of the three treatises under review is that of Mr. MacCormac, which must be regarded as the first handbook on the principles and practice of antiseptic surgery that has appeared in this country, and we are indebted for its appearance to a branch meeting of the British Medical Association, where the author gave an address upon that subject, which was followed by a discussion. At the suggestion of Mr. Spencer Wells, the address was published along with the remarks of the different speakers, and with a view of increasing general interest in the publication, and making it useful to students and practitioners anxious to learn and practise the antiseptic method as it is carried on at the present time, there has been added a short statement of the theory of the antiseptic method, a description of the materials employed in carrying it out, and some applications of the method to operations and injuries in different regions of the body, and to wounds received in war.

The first hundred pages of Mr. MacCormac's work will possess great interest for all readers, inasmuch as they contain the address delivered by the author himself, with the subsequent speeches made by the leading surgeons of our English schools. These have already appeared in the Medical Journals, but in their present form they have been personally revised, and in some cases amplified, so that they may be taken to represent the exact views of the speakers on one of the leading questions of the day. When we say that among them are the names of Mr. Bryant, Mr. Spencer Wells, Mr. Jonathan Hutchinson, Sir James Paget, Mr. Lister, and others, it will be at once seen what a valuable contribution to surgical literature the debate was. Looking at it from a general point of view, the conclusion to be drawn from it seems to be that while all surgeons are more or less inclined to be *antiseptic*, they have not yet made up their minds as to whether what Mr. Hutchinson calls "the spray and gauze system" of Mr.

Lister is absolutely necessary in operations. Several of them hold that some of the simpler methods which are in general use are equally efficacious. As regards this point we are sure they are wrong. Under these other plans the results may be good, but wounds do not behave themselves as under Lister's system, and there is absent that *certainty* in connection with them that we obtain under it. And this leads us to say that one of the objections we have to Mr. MacCormac's book is that, while he professes himself a follower of Lister, he introduces into his work details about substances and other plans of dressing which have not met with the sanction of that surgeon. The result of this is that a practitioner or student taking up the volume as a handbook wherewith to learn Lister's system would find it somewhat perplexing and misleading. Every year shows more and more that the word Listerism must be narrowed in its employment, and that it will not do to speak of a case being dressed antiseptically, but there must be added, whether or not it was according to Lister's system. Of course, Mr. MacCormac has entitled his work "Antiseptic Surgery," and accordingly he is free to introduce all the plans in use, but we would have preferred to see a more rigid adherence to Lister's system in this the first work of any size that has appeared in this country upon the subject so closely associated with that surgeon's name. Had this course been followed we believe that parts of the book would have been better than they are, for the chapter on antiseptic materials is meagre in the extreme, and elsewhere there are several omissions. Thus, we have a very scanty account as to the preparation of carbolised catgut, one of the most important of Lister's antiseptic materials, and we have little or nothing as to the use of the "deep dressing" of gauze and the necessity for its application. We are somewhat surprised, too, to find Mr. MacCormac making no mention of the "antiseptic guard," which is of such service in changing dressings and covering a wound to allow of the spray being replenished or stopped for any necessary reason.

For those who demand this kind of proof there will be found embodied in the work several very important groups of statistics, and for military surgeons those presented by Mr. MacCormac should be conclusive as to the superiority of the antiseptic method in the treatment of gunshot wounds. The illustrations in the book are numerous, and are all excellently done, and the chapter on antiseptic practice contains a long array of valuable surgical cases. But with all its merits we confess to rising from the perusal of the work with a certain degree of disappointment. It is undoubtedly a very able

treatise, but it differs from the first two works noticed in this article in not confining itself sufficiently to Lister's system, which we still regard as the most suitable, the most perfect, and the most reliable of all the methods or modifications of it yet brought before the profession.

Climate and Medical Topography in their relation to the Disease-Distribution of the Himalayan and Sub-Himalayan Districts of British India: With reasons for assigning a Malarious Origin to Goitre and some other Diseases. By F. N. MACNAMARA, M.D., F.R.G.S.; Surgeon-Major (retired), Indian Medical Service; late Professor of Chemistry, Calcutta Medical College, &c., &c. London: Longmans, Green, & Co. 1880. 8vo. pp. 542.

DURING 1866 and the five following years, Dr. Macnamara, while engaged in superintending the examination of the water-supply of cantonments of Northern India, had his attention drawn to the subject of goitre, by the mention which medical officers conducting the analyses frequently made of the prevalence of the simple hypertrophic form of the disease in districts in which they were employed, the disease being usually attributed to the presence of a large proportion of lime and magnesia in the drinking water used by the people. To test the accuracy of this view, Dr. Macnamara made a series of analyses of the waters of the goitrous regions of Northern India; but as the analyses had shown that the "lime and magnesia theory" of the cause of the disease was not tenable, while the habitat of the disease suggested malaria as the real cause, it became necessary to investigate the medical topography and climate of the goitrous regions. Our author says:—"Only when I had collected a mass of notes from a vast number of Indian reports and periodicals, and from other works, did it occur to me that the information which had been pieced together at the cost of much labour and time, might be of value to others interested in the diseases of Northern India, embodying as it does an account of the medical topography, climate, and disease-distribution of Himalayan and Sub-Himalayan districts. It is this which forms the main portion of the work, goitre running through the whole as a kind of connecting and limiting thread."

The first chapter of the work is devoted to a consideration of the geology of the mountains and plains of Northern India; the second, to the relation of goitre and hard water, with

special reference to the "lime and magnesia theory" of the cause of goitre; the third, to the relation of goitre and malaria; the fourth, to malaria and the seasons; the fifth, to an epidemic of malarious fever; the sixth, to the disease-distribution of Northern India; and the seventh, to cholera and malarious fever. The remaining twenty-four chapters are devoted to a description of the medical topography, climate, and disease-distribution of Bengal; Dacca and other districts of Eastern Bengal; Assam; the Surma valley and Muneepore; Northern Bengal; Western or Behar districts; Nepaul; North-West Provinces and Oude; the Doab; Kumaon and Gurhwal; the Punjab; Umballa—Western Jumna Canal; Simla States and Simla; Hoshiaspori; Goordaspuri; Salt-Range (Talagaon); Rawul Pindi and the Hazara; the Peshawur valley; Trans-Indus Districts—Kohat, Bunnoo, Dera Ismael Khan, Dera Ghazee Khan; and other Western districts of the Punjab. The work also contains, in an appendix, a very complete set of meteorological tables, compiled mainly from the official reports, for 1875 and 1876, of the meteorological reporter to the Government of India (Mr. Henry Blandford).

With the exception, therefore, of chapters ii-vii, Dr. Macnamara's work is descriptive; and, by its aid, those interested in the study of the disease-distribution of Northern India are enabled to form a comprehensive grasp of the subject. We cannot speak too highly of the work as a whole: it is a splendid tribute to the many beneficial influences of the Indian Medical Service, as well as to the talents and discriminative industry of its accomplished author. Drawing from his own extensive experience, and from the rich stores of the Indian Blue Books, our author has generalised, and placed in a readable form, within reasonable compass, the best of their contents bearing on the great and important subject of state medicine in India. To the medical profession of India, and more especially to young men entering on the practice of their profession there, the work of Dr. Macnamara must be of great value as a summary of and guide to the results of the valuable labours of their predecessors; while to epidemiologists at home the work is of special interest as exhibiting the broad lines of evidence on which the epidemiologists of India have constructed their theories. We only wish that more information had been given regarding the social life of the inhabitants of Northern India; for while it is of importance to know the geology, the meteorology, the soil, cultivation, drainage, water supply, and general sanitary condition of a country, it is also necessary to know something regarding the movements of the population as

modified by their industrial occupations, their trade routes, and their annual gatherings for social, mercantile, or religious purposes. The question of heredity might also have been more fully discussed.

The conclusions arrived at by Dr. Macnamara are stated as follows:—

“ 1. That a large portion of the most important diseases of Northern India have a common origin under certain conjoint conditions of soil and climate, which we recognise as generating ‘malaria’ and ‘marsh miasma.’

“ 2. That not only fevers of various kinds, and visceral enlargements, but such diseases as dysentery, cholera, goitre, elephantiasis, arise under similar conditions, and obey very similar laws, and would probably prove amenable to the same sanitary and preventive measures, could these be carried out.

“ 3. While thus recognising a concurrence of certain physical conditions as essential to the production of these diseases, we cannot regard these conditions themselves as the cause of the diseases, but only as fostering a *materies morbi* with the nature of which we have no precise acquaintance, but which we conjecture to be some low form of living organism.

“ 4. That, however similar the germs in these different diseases may be, we must assume a specific difference, inasmuch as (while for the most part prevailing together) we have witnessed a very remarkable limitation of some one disease to a well defined area to the exclusion of others, the conditions being apparently the same.

“ 5. That the facts which have been now brought together, while thus indicating certain widely ranging influences as the chief factors in the production of a group of diseases, afford no support to the special views which have been entertained at different times as to the influence of certain kinds of water, electrical and other changes in the atmosphere, chill, infection, and the like, in the production of some of them, except it be as secondary and subordinate agencies.”

Dr. Macnamara’s hypothesis seems to be that a large portion of the diseases of Northern India, such as fevers of various kinds, visceral enlargements, dysentery, cholera, goitre, and elephantiasis, depends on the entrance into the system of specific poisons which may consist of living organisms which have their breeding places in a warm damp soil. The malarial area may be described as the breeding place of these specific organisms; but each is assumed to have its own special habitats, which may be called specific endemic areas.

In the chapter on “An Epidemic of Malarious Fever” (p. 69),

he says:—"We may say, then, that the circumstances of the epidemic of 1869, and of other epidemics of malarious fever in Northern India, while opposed to that view of fever epidemics which would refer them merely to climatic or meteorological causes, are not incompatible with the hypothesis that the epidemic depends upon the production of an unusually luxuriant crop of fever germs fostered by subtle changes in air and soil. Though ignorant of the essential nature of these changes, we yet recognise two physical conditions, warmth and moisture, and perhaps the presence of decomposing organic matter, as more specially conducing to them. On this view the Punjab, like the rest of India, must be looked upon as being the habitat of the malarial germs, just as parts of Bengal are of those of cholera. But why cholera germs should in certain years breed in unusual abundance in one province, and the malarial germs in the other, we cannot say. Probably the germs of malaria may, as we have good reason to think is the case with germs of cholera, become wafted by the winds to a distance from the place of their production, to multiply afresh where they may find adequate warmth and moisture—or other conditions favourable to their growth and development which are less understood—as, for example, in the damp atmosphere of a barrack room, or in the damp soil around the water sources."

It is further stated "that the cause, whatever it is, which gives rise to the severer forms of fever, is in its nature identical with that which produces the milder cases; and if the former depend upon the presence of a specific miasm, the mild cases must do so also, whether they occur during an epidemic or non-epidemic season. The difference between the cases is one of degree only, and depends upon the dilution of the miasm; or upon the state of the recipient; or probably, assuming that the miasm is a living organism, upon the state or vigour of its growth; while the development of an epidemic results from an excessive and widespread production of the poison."

We quite agree with our author that the efficient causes of malarious fever are earth-born, and the recent discovery of the *bacillus malařiae* by Professors Tommasi and Klebs, confirms this view of the etiology of the disease. *The bacillus malařiae* is a soil product, and its propagation is in no respect conditioned on excremental pollution; for it flourishes in greatest abundance and intensity in regions and seasons in which human beings cannot exist without being affected by it. There is, moreover, no evidence whatever that the organism,

if it multiplies at all within the body, is eliminated from it in an active condition. Nowhere have we ever found the shadow of a tradition that malarious fever is communicable. The *bacillus malariae*, like birds and beasts of prey, and venomous snakes, disappears before cultivation and civilisation.

But we may fairly question the hypothesis that the *bacillus cholerae*, assuming the existence of such an entity, is similarly propagated. In the chapter on "Cholera and Malarious Fever" (p. 115), Dr. Macnamara says:—"In the light of what has been learnt regarding the effect of changes in the physical conditions of air and soil upon cholera prevalence we may read as follows, the seasonal history of the disease in the endemic area of Bengal. When, towards the end of February, the weather becomes warm and there is at the time, though rain may not have fallen during many weeks, considerable moisture, both in air and soil—cholera begins to prevail, we must assume that at this time and in March the disease finds the conditions that are most favourable to its rapid development; that is, as it were, the springtime of the crop of cholera poison in the endemic area. Probably the dry heat of April and May exerts some check upon the growth of the poison; but, on the other hand, possibly the store already generated is becoming diffused through human intercourse, and, however this may be, the removal of the most susceptible victims, during the early period of the outbreak diminishes the mortality later on in the season. Still the mortality continues large till, towards the end of June or in July, the rain and rivers saturate the soil, and render it unfit for the development of the poison. As the rain subsides and the soil begins to dry up, cholera again becomes active, and is so throughout October and November, for moisture is yet abundant, and the temperature of the air and soil has not greatly lowered. Now is the time of the second, a weakly crop of the poison, and probably its effects would be less marked than usually they are, were it not that the malaria of the rains has provided numerous fresh victims. Of these many are cleared off before the end of November, and to this, and to the check which the disease receives from the cold of December and January, must be attributed the abatement of the disease during these months."

The invasion of the non-endemic areas, after allowing for the diffusion of the poison by human intercourse, and through the medium of water, food, and air, is explained thus (p. 119):—"Under certain conditions of air and soil, the cholera miasm overflows, as it were, from the endemic area, and invades,

through the medium of the atmosphere, other parts of India, the seeds of the disease becoming sown through the length and breadth of one or more provinces. In many parts of the now invaded area, the seed, for want of congenial soil or climate, dies; in others it remains dormant until, like the seed in spring time, favourable conditions effect its vitalisation, when, if susceptible victims be at hand, an outbreak of cholera results. That these outbreaks should very frequently synchronise is what we might expect from a consideration of the uniformity of meteorological changes in India over large tracts of country. Such outbreak-localities, then, become secondary centres from which the miasm may be distributed by winds, or by human intercourse, to multiply wherever it may find a congenial nidus." This, we need scarcely state, is a reproduction of the aerial distribution theory of Dr. Bryden, a theory which we deem to be utterly untenable, and which has broken down in every instance in which it has been tested by a rigid analysis of facts.

We have, in view of such statements, a right to ask where are the cholera-breeding places in Bengal; or is the entire province a breeding area? During 1877, the total deaths from fever in British India were 2,521,439; while the deaths from cholera numbered 627,577. Throughout the North-West Provinces and Oude, the Punjab, the Central Provinces, and Berar, the death-rate from cholera was lower than the death-rate from enteric fever in Scotland in 1875. In Bengal, the so-called breeding area of India, the death-rate per 1,000 of population was, in 1877, 2·58; while in 1878 it was 1·58. We learn from Dr. Coates' *Sanitary Report* for 1878, that the cholera death-rate in Bengal, per 1,000 of population, was, on the average of 1873-77, 1·92. We have no reliable data on which to estimate the mortality of cholera and enteric fever in relation to the number of persons attacked; but, we may conjecture that the cholera death-rate is much higher than the enteric death-rate. It is probable, therefore, that the percentage of cases of cholera in British India is not much higher than the percentage of cases of enteric fever in Great Britain. The death-rate is about four times greater, but the virulence may be four times as intense.

We are, and always have been, at a loss to understand why Indian epidemiologists so constantly refer to mother earth as the breeding place of cholera, and why they should always find it necessary to call in the influence of the monsoon winds to their aid; for we see nothing in Dr. Macnamara's work which necessitates the creation of such hypotheses. On the

contrary, regarding cholera, like enteric fever, as a filth disease, the only difficulty seems to be in accounting for the fact that British India is not depopulated by endemic and epidemic cholera. Regarding the sanitary condition of Bengal, our author says:—"The insanitary conditions which foster and propagate cholera abound throughout rural Bengal, and have been only partially dealt with in the better class of towns. Soil, water, and air are contaminated by rapidly decaying animal and vegetable substances; the dwellings of the poor, sessile on the damp ground, are crowded, and, if perchance clean within, are surrounded by dirt heaps and dirt pools. Clothing is deficient, often dirty; the food is largely composed of unwholesome material, such as raw acid fruits, decaying fish, new rice, and is too generally insufficient for the needs of the body. As regards water, there is a large and remarkable consensus of opinion among medical and other authorities that impure water is the chief exciting cause of cholera; their want, and ignorance, and carelessness, or fatalism, result in neglect of precautions against disease; and almost throughout the country, at certain seasons, cholera discharges are dissipating in air and water and soil." With such facts before us it does seem remarkable that, in 1876, the largest number of villages attacked in any one district of Bengal was 2,308 in Jessore, out of a total number of 5,287; and that in Midnapore only 478 villages out of 13,957 were attacked. It appears that even when cholera is severe in a district, it is generally confined to a small proportion of the villages; and that the area of diminished epidemic intensity is distinguished not more by the small number of places attacked, than by the small number of attacks in each place. In the area where there is no epidemic, the disease is represented only by a few isolated cases. To obtain correct results, cholera in India must be investigated not only from the standpoint of statistics, but also clinically, from first cases, in the same mode as epidemic outbreaks of the specific fevers are investigated in this country. Taking into account the insanitary conditions of Bengal, and the relation which such conditions bear to the propagation of cholera, a cholera death-rate of 1·92 does not seem to be excessive, and certainly not more so than an enteric fever death-rate of '47 in this country.

Our limits prevent us from discussing Dr. Macnamara's views on Goitre; but we are of opinion that he has demolished the "lime and magnesia theory." We commend the work to the attention of our readers as one of great interest and value. The labour bestowed on its compilation must have been

immense; and nothing but pure love for medical science, in its practical application to the best interests of British India, could have stimulated our author to the completion of his self-imposed task.

Twelve Complete Clinical Charts, adapted for Hospital or Private Practice. By L. J. HOBSON, M.B. London: H. K. Lewis. 1879.

THESE charts cost 1s. 6d. per dozen. They are designed for the record of the temperature, pulse, and respiration, morning and evening, and for noting the changes in the urine from day to day, as to its appearance, reaction, specific gravity, quantity, and the amount of urea, albumen, or sugar present. Little circles are also added for inserting a diagram of the microscopic appearances. Spaces are reserved at the side and bottom of the sheet for notes and remarks on the progress of the case, and the back of the paper is ruled for containing a report of the case on admission. A series of abbreviations supplied allows of the record of many facts very briefly.

The design is probably as good as can be readily devised for the purpose contemplated; but we doubt the wisdom of having ourselves tied down in reporting and noting our cases by any such forms. In one case a certain group of symptoms or facts demands a large proportion of space, while in another it is quite a different group which requires elaborate records. In the present charts, for example, although the greater part of the space is devoted to the temperature and urine, the columns are utterly inadequate for the record of the facts connected with cases in which these points should be fully noted. Thus, the columns allow only of records of morning and evening temperatures, while it is now well known that the most important points connected with temperature variations, particularly as regards the influence of treatment, require very frequent observations. We quite admit the value of diagrammatic representations of the temperature, but we prefer to get the observations noted in figures, and to have diagrams drawn on some form of chart or paper which allows considerable scope for variety as regards the frequency of the observations. In like manner the urinary tables fail to afford room for the annotations required in any important observations on the variations occurring in renal disease with acute symptoms; on the other hand, this portion of the chart must occupy a large space for many cases in which it is almost completely useless.

It will be observed that our remarks apply to the general

conception of such fixed methods for the record of cases, and our objections do not refer particularly to the present charts. We believe, however, that any method introduced into hospital practice should allow of the greatest flexibility for expansion where this is important, and compression where brevity serves the purpose.

REPORTS OF HOSPITAL AND PRIVATE PRACTICE.

GLASGOW ROYAL INFIRMARY.

REPORTS UNDER THE SUPERVISION OF DR. WILLIAM MUIR.

FROM DR. CAMERON'S WARDS.

CASE OF FRACTURE OF PELVIS.—J. C. was admitted on 12th April, 1880, with fracture of the pelvis, the result of a crush between two railway waggons. At night, as he was suffering from retention of urine, several attempts were made to pass a catheter; these proving unsuccessful, however, the urine was drawn off by the aspirator, and this was continued twice a day for three days. On the fourth day Dr. Cameron punctured the bladder above the pubis; the canula was left in for three days, after which it was removed, and an india-rubber winged catheter put in through the opening. As all attempts at raising the legs gave great pain, from rubbing of the fragments on each other, nothing was done till 4th May, when, the patient having been placed in the lithotomy position, Dr. Cameron passed a grooved director into the urethra and cut into the perineum, opening the urethra on the distal side of the injury. The winged catheter was then removed, and a silver bougie passed through the fistulous opening above the pubis forwards into the urethra, as far as the perineal incision. A gum-elastic catheter was then passed through the urethra to the incision, and as an assistant withdrew the bougie Dr. Cameron followed it with the catheter, which, on reaching the bladder, was tied in. Urine came freely through the catheter, and the opening above the pubis gradually closed. Patient made a good recovery, and is able to walk about with ease and to pass urine freely. He was dismissed on 25th June, but has a traumatic stricture, which is being dilated.

WESTERN INFIRMARY.

REPORTS UNDER THE SUPERVISION OF DR. W. G. DUN.

FROM PROFESSOR GAIRDNER'S WARDS.

PLEURISY WITH EFFUSION (LEFT SIDE), AND DISPLACEMENT OF MEDIASTINUM, &c.—ANTIPYRETIC ACTION OF QUININE—QUESTION OF PARACENTESIS THORACIS—GRADUAL ABSORPTION OF FLUID AND RECOVERY OF PATIENT.—The patient, a healthy-looking youth of eighteen, was admitted on 24th May, 1880. There is no history in his case of tubercular or any other constitutional disease. The present illness began about three weeks before admission, with an attack of pain in the left side, lasting about a week; there were also some cough and expectoration. An early feature in the case was difficulty of breathing, and this constituted a leading symptom when he was admitted to hospital. There was still a slight degree of cough, but no expectoration. The decubitus from the beginning of the case had been on the left side. He rested badly at night and perspired rather profusely. The physical signs were those of extensive effusion into the left pleura. On first laying bare the chest an evident fulness was noticeable on the left side comparatively, and, in particular, a loss of the depression of the lower intercostal spaces, and even, as regards the lowest, an amount of fulness to the touch. There was also relative immobility of this side. Percussion was dull all over the left side, the dulness being all but absolute, even to the extreme apex. There was evident displacement of the mediastinum, the dulness in the line of the clavicle passing an inch to the right of the mesial line, at the first intercostal space half-an-inch farther, and from this obliquely downwards to $\frac{2}{3}$ of an inch within the right nipple, being upwards of four inches to the right of the middle line. The respiratory murmur was very feeble all over the left side. In the back the difference of percussion was not less marked than in front, and the difference of the respiratory murmur was perhaps even more marked. The vocal fremitus was entirely suppressed. No râle was heard anywhere on the left side. Circumference of left side 16 inches, right 16½ inches. Patient was ordered a diuretic mixture, containing acetate and iodide of potash, and this treatment was continued throughout the whole course of the case.

Observation of the temperature taken during the first three days of residence showed a very marked and regular periodicity,

identical maximum temperatures of 103·8° F. being attained in each case at nearly the same hour—viz., 5 P.M., a fall of 2·6° taking place before 8 P.M. In view of these facts 30 grains of quinine were given on 26th May, in three doses, between 5 and 6 P.M. The apparent effect of the remedy in this instance cannot easily be disengaged from the previously ascertained tendency to a spontaneous fall of temperature at the hours mentioned; but in point of fact the temperature was 102·8° at seven o'clock, 101·2° at eleven o'clock, and 99·2° at 2 A.M., rising to 100·2° at 8 A.M. There was well marked but slight cinchonism, very gradually subsiding.

28th May.—Patient has a feeling of much greater comfort than before the quinine was administered, he has no pain and no difficulty of breathing when he lies. There is no essential change in the physical condition. A blister was applied to the chest to-day and kept on for twelve hours, producing copious exudation. Pulse 140, respirations 36 per minute. The temperature rose last night to 103·2°; no quinine was administered, but a spontaneous fall took place at 2 A.M. to 101·8°, at 8 A.M. it rose to 102·8°, and at 11 A.M. to 103°. An hour later, that is at noon, to-day, administration of quinine was commenced, 36 grains being given during a period of two and a half hours. The temperature then began steadily to fall, being, at 5 P.M., 100·4°, and remaining at this till 2 A.M. next morning, a further fall to 99·8° being registered at 5 A.M.

31st May.—Quinine given last night as before, this time followed by a greater fall than any of the preceding, the temperature being 98·4° at 9 A.M., as compared with 103° last night.

1st June.—Patient can now lie on right side, dyspnoea is insignificant, the colour good, and the emaciation, though evidently advancing, not at all striking, considering the other facts. Physical signs cannot be said to have undergone any appreciable change.

At this date the question of paracentesis was seriously entertained, but postponed on the ground of there being no immediate urgency. At a clinical lecture the whole subject was discussed in the light of the preceding facts; and reasons were given in detail for the conclusion arrived at.

14th June.—Patient expresses himself as being perfectly comfortable, altogether free from any sense of dyspnoea, able to lie with equal comfort on either side, only slightly troubled by cough, and evidently, as regards the pulmonary symptoms, very much relieved since admission. There is a decided change for the better in the physical signs, marked

first by a removal of the line of dulness at the level of the nipple, at least an inch towards the left; and, secondly, by a distinctly dull tympanitic quality of the percussion-sound over the greater part of the left apex, and a decidedly greater amount of respiratory murmur here than has been noted at any previous period. No change posteriorly. Quinine was employed again on the 4th, 6th, and 7th inst., with the usual effect of an immediate fall of, on an average, 3°. At the same time it is difficult to be sure there is any permanent effect from these administrations, for after the one on the 7th the temperature is found to have risen again speedily to 101·8°, going on with very considerable oscillation and with daily maxima culminating on the 11th at 102·2°.

24th June.—The changes in the case are most striking, and all in the direction of amendment. Patient is up every day, and feels decidedly stronger from day to day, and this notwithstanding a measure of febricula almost daily, the whole series of temperatures showing however a gradual abatement, the night sweats also being decidedly less. Not less striking are the physical changes in the condition of the chest. The line of dull percussion at the mediastinum has become almost normal. Cardiac sounds have ceased to be distinct and superficial near right nipple, and have returned close to the left nipple. It cannot be said there is any dulness above the second rib; below this percussion is still dull, but in the left hypochondrium gastric percussion has returned in the usual situation. There is further observed to-day well marked superficial friction in front, so diffused that it may be almost said to be general. The respiratory murmur is still feeble and tubular.

30th July.—Patient feels perfectly well as regards his chest. The temperatures have been almost normal since the beginning of July, with the exception, since the 17th, of a slight elevation of the evening temperatures, which perhaps may be connected in some way with a pain in the left sciatic nerve, from which he has been suffering for a short time.

3rd August.—Patient is now convalescent, and might be dismissed, but for the persistence of the sciatica. Percussion-sound over the whole of the left front and lateral region of thorax is now nearly normal. The respiratory murmur in front is almost normal in quality; there is still, however, a marked deficiency in the lower lateral region. At the back the impairment of percussion is much greater than in front, especially at the base. No friction sound can now be detected. There is still a well marked difference in the movements of the

two sides. Some contraction of the left side has taken place; it now measures $14\frac{1}{2}$ inches, the right being $16\frac{3}{4}$ inches.

PLEURISY WITH EFFUSION—HISTORY OF ANTECEDENT PNEUMOTHORAX.—This case bears some resemblance to the foregoing one, but need not be related so fully, and is brought forward at present chiefly with the view of affording further ground for remark on the question of operative interference in cases of large pleuritic effusion. The patient, aged 22, had an attack of haemoptysis in September last, which proved severe and in large quantity, continuing in frequent gushes for eight days, but not recurring till March, when he had a few spits of blood. In November he suffered from what was regarded as an inflammation of the right side; the attack was ushered in by severe pain, lasting about twenty-four hours. During this illness the dyspnoea, of which he still complains, seems to have been greatest, and it was at this time the diagnosis of pneumothorax was made by his medical attendants, upon grounds which Dr. Gairdner considers quite indisputable. When admitted to hospital, on 30th June, there was dense dulness to percussion all over the right side, and the physical signs generally of considerable pleuritic effusion. No amphoric phenomena of any kind were detected, and nothing in conformity with the idea of pneumothorax then existed. The previous history, however, was carefully and minutely reported by Dr. Miller, of Dundee, in such a way as to show both the occurrence and the subsequent disappearance of pneumothorax. The general condition of the patient was tolerably good. When at rest he was quite comfortable, free from pain and dyspnoea, not however fit for any considerable exertion, although able to walk the distance of a mile without feeling much exhausted. Pulse, respiration, and temperature uniformly normal, or perhaps subnormal during the few days observed. No clubbing of fingers; colour good.

Notwithstanding the evidence of considerable effusion, there appeared to be no urgency in the case, and it was determined not to interfere actively in the meantime. He was accordingly dismissed on 7th July, with instructions to report himself in about two months.

Remarks by Dr. Gairdner.—The second of these two cases has an interest of its own much beyond the practical questions immediately involved in it; and it is only necessary to refer to a note at p. 409 of my *Clinical Medicine*, and to several communications since published in the *Lancet* and the *Glasgow Medical Journal*, to show that the association of pneumo-

thorax with pleurisy not immediately and rapidly fatal, and in some cases ending in a spontaneous recovery more or less complete, has been very constantly before my mind for many years. But in the present connection it seems only necessary to say that the knowledge of such favourable terminations formed, in this case, the ground for abstinence from operation, there being also every reason to believe that favourable progress is being made, the nature and limits of which, however, can only be tested by time. In the first case there was, however, on admission, a much stronger inducement to operate, there being not only very considerable dyspncea, but proof of mechanical distension and displacement far beyond the amount which, in the opinion of most of the modern extreme advocates of "aspiration," would have amply justified, or, indeed, rendered imperative, the puncture of the chest. Although I claim to have been one of those who, following in the wake of Dr. Bowditch, of Boston, anticipated Dieulafoy in all the essentials of the modern French practice, I do not now, and never did, regard that practice as being required in acute and sub-acute cases, to the extent that has become habitual in the Parisian hospitals, and in some quarters at home (see pp. 369, *et seq.*, of *Clinical Medicine* for general statement of opinions in 1862). The principal grounds on which, as stated at the time in clinical lecture, the operation was postponed, and ultimately avoided, in this case, were as follows:—First, the case was only in the third or, at most, fourth week on admission; secondly, even on 1st June, when the urgency of the symptoms was still so considerable as to keep the question in a balanced state before the mind, it was only, at most, the beginning of the fifth week of the effusion; thirdly, the close observation of the symptoms, and the relative circumference of the two sides of the chest, appeared to afford a hope that the effusion was not increasing, and perhaps even diminishing spontaneously; fourthly, although hectic fever was a prominent feature, so much so as to suggest it as not improbable that empyema might be forming, there was no immediate symptom of danger, and, therefore, no obvious disadvantage in waiting. The result has, so far, justified the course adopted; but I do not, on this account, presume to affirm that paracentesis would not have been followed by a like result; only I regard it as a measure not without disadvantages and even dangers which, being, whether great or small, incalculable beforehand, are to be set against the risks of the spontaneous course of the disease without such interference. A very little more of apparent

distress, or hazard in the disease itself, would, in my opinion, have made paracentesis probably expedient in this case; nevertheless, as the successful result was attained otherwise, and as but few such cases are put on record in comparison with those in which aspiration has been performed, the case seems to be not without its practical lessons, and, therefore, one to be preserved. The antipyretic action of large doses of quinine was very well shown, notwithstanding the spontaneous daily oscillations of the temperature, by means of a chart which was from time to time exhibited to the class, but which it is not convenient to reproduce here. Another fact, particularly noticed at the bedside, but not included in the condensed abstract of the report here furnished, was a clicking râle, which, at a certain stage of the convalescence, presented itself in the left pulmonary apex, suggestive of possible tubercle there, but finally merged in the widely distributed friction sound noted on 24th June, and not again reappearing. The import of this sign is still uncertain.

MEETINGS OF SOCIETIES.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.

SESSION 1879-80.

MEETING XI.—7TH MAY, 1880.

DR. FERGUS, *President, in the Chair.*

DR. GAIRDNER showed a patient who had recovered from unusually frequent attacks of EPILEPTIFORM CONVULSIONS, WITH HEMIPLEGIA AND TRANSIENT APHASIA, connected probably in their origin with syphilitic gummata of the membranes of the brain, there being a distinctly syphilitic history. The case had been treated by very large doses of iodide of potassium, the administration of which was followed by a succession of phlegmonous appearances attributed to the iodide. When this disturbance was at its height the patient began to improve, and steadily progressed. [For further account of the case, see this *Journal*, vol. xi, pp. 61 and 383.]

DR. GAIRDNER read "On certain points in the Treatment of Bright's Disease, Historically and Clinically considered." See p. 177.

Mr. John Reid said that he was old enough to remember the beginning of the period when every case of dropsy admitted into the hospital was anxiously investigated with a view to determine whether the kidney showed evidence of Bright's disease. The name had been productive of harm, in so far that it did not stand for one special disease, but included several very different pathological conditions. Richard Bright had, in his opinion, obtained credit for a good deal which had been done before him. Thus, Baillie's *Morbid Anatomy*, published years before Bright's researches were made, anticipated these researches to a considerable extent. Even Cullen, though not using the term "albuminous" urine, stated very distinctly that the white corpuscles of the blood were found in the urine. Bright's disease might arise either from acute, chronic, or sub-acute inflammatory action—generally the latter. In acute nephritis, antiphlogistic treatment was the only method practised. A good bleeding at first, followed by mercurial medicines, always checked the disease, and was followed by natural diuresis. Drastic purgatives produced heat and irritation, draining off by the intestines the fluids which would pass off by the kidney. Saline diuretics simply produced an excess of watery elimination by the kidneys. When giving diuretics he always gave plenty of diluents, such as barley water, as these aided the kidney without irritating it. The infusion of digitalis with the acetate of potash was a capital diuretic. Leeching and cupping over the loins were of great advantage.

Dr. Perry said that he had been brought up in the faith of the English school, that diuretics were bad treatment in Bright's disease. His early experience as a hospital physician, acting on this principle, had been unsatisfactory. He had therefore resolved to test for himself the various modes of treatment, and he had come to the conclusion that treatment by diuretics was, in very many cases, the most successful. He differed from Dr. Gairdner as to the utility of cream of tartar. Digitalis in his hands had yielded more satisfactory results, though it undoubtedly required to be watched with more care. In cases in which diuretics would not act he had given drastic purgatives, though always unwillingly. He now preferred cream of tartar, with compound jalap powder. Hot air baths, with the patients in bed, were often of service. He had also tried pilocarpine, but its action was uncertain. He had made

little use of blood-letting, though he occasionally cupped over the kidneys. A smart dose of mercury, combined with digitalis, acted admirably as a diuretic, even in cases in which the drugs separately would not act.

Dr. Lapraik said that he had had two cases in which the skim milk treatment was successful after every other had failed. In the first case the urine was completely suppressed, and the patient was in a semi-comatose condition. On the third day of the treatment he was passing a pint of urine, and the quantity rapidly increased. The anasarca gradually disappeared. The treatment lasted eighteen days. In the other case the stomach rejected every other mode of treatment. The result was equally satisfactory, and with even a shorter period of treatment than in the former case.

Dr. Murdoch Cameron could testify that, in the acute attacks following scarlet fever the compound jalap powder was most serviceable. Cream of tartar with butter milk was the diuretic most in use by the common people.

Dr. Smart said that some years ago he had been led to try counter-irritation over the kidneys. One difficulty was to get a proper counter-irritant. He finally, after some trials, adopted the iodine liniment, and with markedly good effect. The diminution of the amount of albumen, and, coincidentally, the increase in the evacuation of urine, were most marked. The result was probably due partly to the effects of the drug as a counter-irritant, and partly to its absorption. That it was absorbed was proved by its being detected in the urine, and even verified by the metallic taste in the patient's mouth.

Dr. Charteris said that he had lately made it a part of the routine work of his wards to test the amount of urea eliminated. When the urea was notably diminished, there could be no doubt that digitalis had a marked effect in increasing it.

Dr. Gairdner, in reply, said that there were several modes of treatment to which in his paper he had made no reference, for the reason that he had nothing of interest to say of them. The skim milk treatment he had tried, but with results markedly unfavourable. There was really no one treatment which would cover the whole ground; and the lesson to be learned was, that they were bound to be eclectic, and to discard fanaticism of every kind. He thought that some amount of discussion on the diuretic treatment would be of use in bringing them to a certain extent back to the old lines.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.

SESSION 1879-80.

MEETING VIII.—20th APRIL, 1880.

DR. ALEX. ROBERTSON, *President, in the Chair.*

DR. FOULIS showed the CHANGES IN THE RETINA IN RENAL DISEASE. The specimens were the posterior halves of both eyeballs, from a case in which there had been uræmic convulsions and loss of sight during the last ten days of life. The kidneys were slightly larger than the normal; their capsule was rather adherent to the surface, which was *granular*, very pale, and here and there dotted with venous stars; the cortex was thickened (on section) and very pale; the pyramids were pale purple. The left ventricle of the heart was much hypertrophied, the wall being one inch thick; there was no valvular disease. In both retinæ were punctiform haemorrhages, and one or two small yellowish patches; on the choroid were several pale irregular patches; microscopic examination had not yet been made.

DR. FOULIS showed A SPECIMEN OF UNION OF ANTERIOR SEGMENTS OF AORTIC VALVE, from a case in which no symptoms of aortic disease had been noticed during life. The two anterior aortic segments were united into one broad valve, and the edges both of it and of the remaining segment were thickened slightly. The central part of the anterior valve had a tendinous aspect, and on the upper surface there was an indication of a division of the pouch of Valsalva. The condition was probably congenital: but there may have been changes of an inflammatory nature in or on the valve segments during the life of the patient. The aorta had been injected with wax for another purpose, and by it the valve had been brought into play, and the completeness of its action demonstrated. It was noticeable that in spite of the thickening of the edges the closure was still complete.

DR. PERRY showed SPECIMENS FROM A CASE OF MULTIPLE EMBOLISM, of which he read the following notes:—

Mrs. B., aged 24, admitted 14th January, 1880. With the exception of a severe attack of enteric fever when a girl, she enjoyed good health till about two years ago, when, in consequence of living in a damp house, she for some time suffered from acute pains, confined to the feet, and most intense in the plantar fascia. She is the mother of three children, and is

now again about the end of her seventh month of pregnancy. There is a history of occasional over-indulgence in drink, and she states that for a length of time she has been unable to get proper nourishment on account of her husband being out of employment. About three months before admission into the hospital she was seized with a severe cold, followed by the usual symptoms of acute rheumatism—pains and swelling in almost all her joints, of a shifting character, and accompanied by profuse perspirations of an acid odour. She also had pain in the cardiac region, but cannot state definitely at what time this symptom appeared. The pain and swelling of joints subsided in about four weeks, but the cardiac pain still continues, and is much intensified on taking a deep inspiration or on coughing. There are no symptoms of any pulmonary disease, or of any disorder of the digestive system. There is no increase of cardiac dulness. The heart's impulse is, however, much increased, and its sounds are heard over an abnormally wide area. A very loud and rough mitral systolic murmur is present, most distinctly heard at the apex. No increase of temperature, and very slight perspiration. Urine normal in quantity; sp. gr. 1020, slightly acid, and contains a large amount of albumen. A blister was applied over the region of the heart, and scrupule doses of the salicylate of soda were administered three times daily. Her general health was improving, and the cardiac murmur was becoming diminished in intensity and roughness.

On the 29th January, her right arm became suddenly powerless and intensely painful. The elbow was bent at an acute angle, the hand rotated, with the wrist and fingers firmly flexed. No pulse could be detected in either the axillary, brachial, or radial arteries of right arm. The temperature in right axilla was 90° F., in left axilla 100° F. The loss of motion in the right arm continued for two hours, and was then gradually restored. Two days after the disappearance of the pulse it was again detected, although very feeble, at the wrist, for about forty-eight hours, after which it could never again be felt. On the fourth day after the obstruction of the axillary artery the temperature of the right arm became higher than that of the left, and for three days this relation was maintained, the difference averaging 2°; after this time it fell slightly lower than that of the left.

On 3rd February she was delivered of a male child, which was considerably below the average size, and very weak. The baby died on 10th February. The lochial discharge was moderate in quantity. Little or no milk appeared in the breasts, and no attempt was made to suckle the child.

On 13th February she was seized with an acute pain in the left popliteal space, attended with coldness of the whole leg and a partial loss of sensation, but no loss of motor power. Mustard poultices soon restored both warmth and sensation to the limb, but the pain, although partially relieved, continued in a less severe form for several days, and diminution of the arterial pulsation was detected in the limb. As her appetite and strength were both getting very much impaired, and she complained of great sleeplessness, she was ordered a mixture containing quinine and small doses of morphia, in addition to four ounces of brandy daily.

On 20th February she began to suffer from diarrhoea and frequent vomiting. Both of those symptoms became more severe and constant, and resisted every remedy which was administered with a view to their relief.

27th February.—No pulse could now be felt in either of the wrists, and the patient lay in a semi-comatose condition, although she could be roused to answer questions rationally. Passed urine and faeces involuntarily.

1st March.—Had to-day quite recovered her consciousness, and was bright and talking cheerfully. Appetite also improved, and vomiting much relieved. Some urine was drawn off by catheter. It was of a deep blood-red colour, slightly acid, and contained a large quantity of albumen. Microscopic examination showed abundance of blood corpuscles and pus cells, but no casts.

She continued more cheerful and sensible up till next day, 2nd March, at 5 P.M., when she became dull, and her face assumed an expression of vacancy, the eyes being widely open and staring, while the pupils were contracted. The same evening, at 8 P.M., she had a slight convulsive fit, lasting for about two minutes, after which deglutition became difficult and breathing stertorous. Other two convulsive fits followed, and she died comatose at 1:30 A.M.

On post-mortem examination by Dr. Foulis, the following lesions were found: in the pia mater, over the upper part of the left hemisphere, was a little haemorrhagic effusion, but no disease of the vessels could be detected with the naked eye; on the mitral valve there were masses of soft yellowish granular vegetations with some soft red blood clot adherent, and these vegetations covered some of the chordæ tendineæ, and extended over the surface of the endocardium towards the aortic valve; over the posterior face of the epiglottis, interior of larynx and trachea, and also a small area at the upper end of the gullet, were numerous punctiform haemorrhages; in

both brachial arteries were adherent pale thrombi, each enclosing a small mottled white and red embolus; in both common iliac arteries, at their bifurcation, were similar plugs, with red blood clot above and below them; in one of the larger divisions of the superior mesenteric artery supplying the ileum was a pale oval plug at the bifurcation of the artery, and on it a little loose red clot, but the vessel above and below not choked with thrombus, with the exception of one small side branch in which was a red clot; the lining of the bowel supplied by the artery in which the embolus lay was purple, deeply injected, in places grey and sloughy, its valvulae conniventes thick, firm, and greyish-brown in colour, the Peyer's patches in some instances thickened, in others entirely sloughed away, leaving the muscular tissue bare. In kidneys and spleen were yellow or shrivelled blocks of older date.

Dr. Foulis gave details of the *post-mortem* examination in this case, more especially with regard to the lesion in the bowel consequent on the embolism in the superior mesenteric artery. In connection with this, which seems to be a very constant accompaniment of this embolism, he showed the bowel and mesentery of a soldier who, six years before death, had been kicked in the belly by a horse, and had then sustained a lacerated wound of the mesentery. The edges of the lacerated wound had healed, leaving a large gap in the mesentery; one side of this was the bowel, bare and free from mesentery, like an isolated tube, for a distance of four inches. In spite of this isolation of the bowel it had lived and was healthy and well nourished; the death of the patient was caused by the strangulation of another part of the bowel in the open gap in the mesentery. He quoted also Professor Nussbaum's case, in which, during an operation, the bowel had been isolated from the mesentery for 16 or 17 inches, and yet the patient had made a good recovery. Now, in the face of the recovery of the bowel after such interference with its vascular supply, it was difficult to see why the plugging of a single loop of the superior mesenteric artery (which was not an end artery) should involve so constant and grave changes in the bowel as it did. Professor Cohnheim had said that it was explained by the great vulnerability of the vascular supply of the bowel; but that was merely another way of stating the fact of its occurrence, and was not at all an explanation of why it occurred. Besides, the cases of isolation of the bowel, &c., clearly pointed to extreme tenacity of vitality rather than to vulnerability in this region. *Dr. Foulis* held that a satisfactory solution of the question was still to seek.

Dr. Coats took exception to Dr. Foulis' criticism of Cohnheim's view. He says it is a vulnerability of the vessels of the bowel, and not the bowel itself. His view is not merely theoretical, but based upon experiment.

THE SECRETARY presented for DR. M'PHAIL a specimen of SCIRRUS OF MALE BREAST.—John C., a stout, hale old man, aged 77, was admitted into one of Dr. Macleod's wards at the Western Infirmary, in February last, with a tumour in the left breast, of eight months' growth. It was first noticed as a small, hard nodule, involving the nipple. It had grown slowly, and caused no pain or discomfort till two months before, when he received a blow upon it. Since then it had been slightly painful, but had not grown more rapidly than before. On admission the tumour was found between 2 and 3 inches in diameter, and was hard, irregular, and nodular. The nipple was retracted slightly. The skin over the growth was dusky and purple in colour, firmly adherent to the growth, but unbroken. The tumour slid freely over the subjacent tissues, and there was no affection of the axillary glands. No case of cancer had been known among his relations. He had a large fatty tumour removed from his right shoulder twenty-four years ago. The tumour was excised in the usual manner. No vessels were tied. On examination, after removal, the growth, which had apparently involved the whole gland, and extended into the tissues all round, presented on section the characteristic "frosted turnip" appearance of scirrhus, with yellow spots of fatty degeneration and softening. The microscopic appearances are characteristic. Patient made a rapid and good recovery.

In August last Dr. Macleod operated in another case on a man aged 51. A small nodule, like a pea, had been present near the nipple for four years, and had only grown rapidly within six months before admission. The tumour in this case also was in the left breast, and the clinical features presented were almost exactly the same as in the case above recorded.

The *Medical Times and Gazette*, for 3rd January, quotes two cases from an Italian Journal, in men aged 49 and 60 years. Both were excised and both recurred within a year, and in both cases operation for removal of the recurrent growths was followed by death.

M E D I C A L I T E M S .

UNDER THE DIRECTION OF

ALEX. NAPIER, M.D.

Treatment of Aortic Aneurism by Electro-Puncture.

—Dr. Dujardin-Beaumetz records two fresh cases of aneurism of the aorta which he has treated in this way, and in doing so presents an interesting account of his method of employing the electric current for this purpose, and a review of the results of electro-puncture in France generally. He uses only Gaiffe's battery. The needles he recommends have no head, and vary in thickness from 5 to 7 tenths of a millimetre. The conditions which determine the thickness of the needle to be employed are these:—The length of time during which the current is to be passed, and the presence or absence of coagula in the sac. He has noticed that if a current traverses, for ten minutes, a needle less than five-tenths of a millimetre in diameter, there is a risk of breaking the instrument in extraction, and leaving its point in the aneurism. On the other hand, thin needles must be used at first, in order to avoid risk of haemorrhage, if the sac be found to be thin and pulsating strongly; subsequently, however, when repeated séances have led to the formation of coagula of greater or less thickness, needles of greater diameter should be introduced. The needles are of soft iron, and are covered with an insulating coating, except at their two ends. The wire connecting the needle with the battery is extremely thin, to permit the needle to oscillate slightly when in position in the sac. The needle is introduced by means of an apparatus designed for this purpose by Gaiffe; this enables the operator to regulate with precision the depth to which the needle is entered, saves much suffering on the part of the patient, and prevents the insulating coating from being rubbed off—an accident which favours caustic action and sloughing on passing the positive current. The needle should also be withdrawn by means of Gaiffe's retractor, an instrument which slowly twists it out. The author thinks the employment of these two little instruments of Gaiffe's of great importance; forceps should never be used instead, as their use involves the putting forth of more force, gives more pain, and is apt to break the needle, which is already thinned and weakened by the action of the current. The negative pole is represented by a large flat plate placed on the thigh; this plate is pierced by a number

of holes, and covered with chamois leather; it is moistened when applied, to lessen the smarting which this pole always produces. The strength of the current may be accurately regulated by means of Gaiffe's galvanometer, the needle of which should point to about 54 on the scale. M. D. has been a strong advocate, ever since 1877, of the practice of having only the needles representing the positive pole in the aneurism. With regard to the number of needles to be inserted, and the duration of the current, the author at first followed Ciniselli's practice of introducing four needles, and of passing a positive current through each for ten minutes, at two applications of five minutes each. Now he never uses more than two needles, and most often only one; a longer period of action might lead to too deep corrosion of the needle, and cause it to break in extraction. (It is here suggested, as matter for further investigation, whether it might not be of service to pass the current for a longer time, in order to destroy completely that portion of the needle which is left unprotected by the insulating covering. Might not the particles of iron so detached act as centres round which coagulation of the blood in the aneurismal sac would go on? And, further, not only is the oxide of iron formed under these circumstances, but very probably also the chlorides; and these have a coagulant action on the blood.) While the author thus limits the number of needles, and the duration of the current, he advises the more frequent repetition of the operation—every eight to fifteen days; nevertheless, if the intervals are unduly shortened, pain and inflammation result. No anæsthetic, local or general, is used; the ether spray has an unfavourable influence on the coagulation of blood in the sac; chloroform also, in such patients, often causes grave syncope, and this occurs the more readily as those suffering from aneurism usually suffer also from aortic insufficiency. Neither ice nor collodion is applied to the puncture holes after extraction of the needles.

M. D. has followed this method of operating for three years, and neither in his own cases, nor in those of his friends, has it been attended by any accident. In one case, however, the passing of the current caused fainting; but this patient had, for years, been subject to such attacks, and they occurred on very slight provocation, such as on being informed of the nature of his disease, and again, when a cardiographie tracing was being taken. The pulse of another patient, a man of excessively nervous temperament, fell markedly when the current was started; though it was thought better to interrupt

the operation then, nothing of the kind occurred at subsequent *séances*.

The electric current acts as an irritant to the sac, producing inflammation of its walls, a curative endarteritis, determining the formation of adhesive coagula; it has also a directly coagulant action on the blood. The fact that the clot so produced is an adhesive one is strongly insisted on; the author has never observed anything of the nature of embolism, though he has operated twice on aneurisms of the innominate artery; in the first instance there was temporary improvement, and in the second, operated on in February, 1879, the improvement then effected still continues. It has, nevertheless, been observed that the clot so formed may split up, and admit of the entrance of blood between its layers, in such a way that just as a complete cure seems to be established the aneurism suddenly shows signs of further extension; this is what occurred in a case recorded by M. Bucquoy.

Positive and lasting cure of aneurism by this means, if an instance of this kind has yet been observed, must of necessity be very rare, as we are able to attack the sac only at very few points on its whole extent—namely, those which in front or behind come into direct contact with the walls of the chest.

Dr. Petit has collected, in the *Dictionnaire Encyclopédique* (Article *Galvano-puncture*) no fewer than 114 cases of thoracic aneurism treated by electro-puncture. In 68 of these decided improvement was obtained, this improvement lasting at least a year in 35 instances, at least two years in 11 cases, and in 3 cases, three, four, and five years respectively. Petit's statistics also show the great advantage of operating before the aneurism forms an obvious external swelling; improvement resulted in 73 per cent of such cases, while in those cases in which there was an external tumour, improvement was noted in only 51 per cent. M. D.'s experience, however, is all in favour of electrolysis in thoracic aneurism; even in instances in which the progress of the disease is not checked, it brings about marked amelioration of pain and of the feeling of throbbing.

In the first of the two new cases here recorded, the patient, a man of 53, had been confined to bed for nine months, suffering intolerable pain, which was kept in check only by subcutaneous injections of morphia, and these had to be increased in number every day; he had also had repeated arterial haemoptyses. Here relief was so marked that after five *séances* he was able to get up and walk about with ease; pain was lessened to such a degree that he needed only half a syringeful of the morphia solution per day; the patient's general health

underwent remarkable improvement ; the swelling diminished notably in volume, became harder and firmer, while the movement of expansion of which it was the seat had greatly decreased.

In the second case the patient was robbed of sleep, had incessant cough, intense dyspnoea, great pain, could not rise from bed, while the tumour was increasing daily in size. After five operations he slept comfortably, his pains disappeared, he could rise and walk without difficulty, and was about to set out for the country well satisfied with the progress he had made.

The author concludes with the statement that electro-puncture is a most rational method of treatment for aneurisms of the aorta, and that if it is capable of effecting the cure of the disease only in very exceptional cases, it rarely fails to give substantial relief, even in conditions when every other mode of treatment is powerless, and that without the least danger, if the directions above laid down are scrupulously followed.—*Bull. Gén. de Thérap.* 15th July, 1880.

Creasote as a Therapeutic Agent in Chest Affections.—Dr. Reuss of Paris has devoted a good deal of attention to this remedy in phthisis, and has found it very effectual in his dispensary practice, where he was able to give it systematically, and formulate the results. The irritation which it is apt to set up after a time in the air passages, and also in the alimentary canal, he has found, in common with others, to be the great drawback to its general employment. He tried it in alcohol, then with cod liver oil or glycerine, but in all these media he suspected that it was now and then the cause of a dangerous or even fatal exacerbation of throat or intestinal inflammation. He was led eventually to try balsam of tolu, and found it in all respects a safe and effectual solvent, counteracting, as one would expect, the irritating properties of creasote and its tendency to arrest expectoration. It is essential that the creasote be absolutely pure, the test on which he relies being that it does not coagulate collodion. He prescribes it in lozenges (*dragées*), the formula for each being—

Pure Balsam of Tolu, 20 cent. (3 grs.)

Pure Beech Creasote, 5 cent. ($\frac{3}{4}$ grs.)

Excipient, Q. s.

Two of these for a dose ; given at first night and morning, and gradually increased, sometimes up to ten lozenges in the day.

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He tabulates the results in twenty cases. Five patients in the first and three in the second stage were apparently cured; three in the first and three in the second stage improved; three in the second stage were unaffected, and one in the second and two in the third stage died. More recently he gives a detailed account of a case which was apparently passing into the third stage when the above treatment was begun. The patient was a stone cutter, at 40. He had been losing flesh for a considerable time, perspired profusely, and had severe cough with foetid purulent expectoration. Liquid râles, with other signs of a like import, were heard in both apices. Dr. Reuss gives an exact and detailed report of the patient's progress over a period of ten months till, on 1st April, he is stated to be regularly at work in the country, robust and strong, and with only a slight roughness of the respiratory murmur over the upper part of chest. It must be noted that he took latterly, in addition to the creasote, quinine wine and cod liver oil.—*Journal de Thérapeutique.* 25th August, 1879 and 10th May, 1880.—J. W. A.

On the Class of Cases in which Vaginal Anteversion Pessaries give Relief to Symptoms.—Dr. G. E. Herman tries to show that only in certain cases of anteversion are pessaries useful, and that they are those which are usually accompanied by cystocele. The conclusions to which he comes are:—

“1. Anteversion pessaries are certainly useful only for cases in which the morbid condition consists in a slight degree of yielding of the anterior or pubic part of the pelvic floor.

“2. Such yielding produces most commonly cystocele, sometimes anteversion, occasionally both; and the same symptoms are produced, and the same treatment will relieve, whichever of these conditions be present, the position of the uterus being comparatively unimportant.

“3. The symptoms which this yielding produces are—irritability of the bladder and bearing-down pains.

“4. These symptoms, when dependent on such yielding of the anterior division of the pelvic floor are at once and certainly relieved when support is given to that structure.”—*Obstet. Jour.* May and June, 1880.—W. L. R.

Treatment of Rheumatic Fever by Hot Washing Soda Baths.—Dr. Crowther reports two cases of rheumatic fever, in which he believed life had been saved by treatment with hot washing soda baths. The two cases had derived no

benefit from other remedies, and experienced immediate relief on being immersed for fifteen minutes in hot water, to which half a pound of common washing soda had been added. The bath caused both diaphoresis and diuresis, and promoted natural sleep, after which recovery took place rapidly. In other instances it has had an equally beneficial result.—*Australian Medical Journal.* April, 1880.—G. S. M.

Diastases in the Bones of the Lower Extremities of the Fœtus, produced by the Accoucheur.—In the *Edinburgh Medical Journal* for June, Professor Simpson has an article on this subject. In a case of turning for placenta prævia, the child being dead, he had an opportunity of making a dissection of one leg in which the only external appearances of injury were a slight abrasion over the internal malleolus and an undue mobility of the ankle joint, as if some of the ligaments had been torn through. “ Yet at three different points fractures were found on dissection. They were all fractures of the kind known to surgeons as ‘diastases’—the shaft of the bone, that is to say, had become detached from the epiphyses. The seats of the diastases in the right leg are, 1st, the upper end of the femur below the trochanters; 2nd, the lower end of the tibia; and 3rd, the lower end of the fibula. There has also been some separation of the epiphysis of the lower end of the femur, but the upper ends of the tibia and fibula are quite firm. In the left leg the epiphysis of the lower end of the tibia is loosened, but the epiphyses at both ends of the femur are firm.” Dr. Simpson was led to make this examination from reflecting on a case which he has already published of a similar kind, except that the child was born alive. The left leg was found on the day after birth to be greatly swollen, with abrasions of the skin above the malleoli, and the limb hung stiffly from the pelvis. At that time he believed there was no injury to the bone or joint, but some laceration of the muscles and vessels. He is now inclined to think there may have been some fracture similar to that referred to. He would recommend in every case of turning an examination of the limbs of the child, especially if there has been considerable traction exercised. If there be complete separation between apophysis and diaphysis, and the periosteum lacerated in the entire circumference of the bone, the hiatus will be easily traceable and crepitation may be felt. When there is simply loosening of the epiphysis the diagnosis will be more difficult, as crepitation may not be perceptible. In the latter case nothing will be required

beyond seeing that the limb is kept as much as possible at rest, but should the periosteum be lacerated, it will be necessary to bandage the limb to keep the separated portions of bone in apposition.—J. W. A.

Case of Phantom Tumour Simulating Pregnancy
which occurred in the Zoological Gardens in Dublin; by Rev. Dr. Haughton.—Dr. Haughton says—"I purchased, some years ago, at Antwerp, a fine specimen of the rare variety of the zebra called the Burtchæll zebra, which variety is brown and black, is a very handsome animal, and is rarer than the black and white one. I endeavoured to procure for the zebra I had bought a female pony as a partner, but the price of ponies had risen so high that I obtained for him a healthy three-year old virgin ass from the county Kildare. It was absolutely necessary to have a female ass that had not previously had intercourse with either a horse or a male ass, because it is well known amongst cattle breeders that the first intercourse gives a stamp to the subsequent offspring. Intercourse took place repeatedly between the two animals, and appeared complete. Menstruation ceased, and the ass in question seemed, to use the words of old Weller, to be 'wisibly swellin'' before our eyes. 'Just feel the foal inside her,' said the man skilled in these things, but my imagination did not go so far as that. The eleven months expired. I had already discounted the result as a handsome zebra foal worth £50; but to my great disgust nothing came of it, and then I was informed that the ass had come into season again. We gave her the zebra again, and again she swelled and ceased to menstruate, and again nothing came of it. We thought she might have aborted and eaten the produce, but no trace of remains of placenta or blood could be found. After five months we gave the ass the zebra again, and again the same enlargement took place; but exactly at the end of the eleven months the swelling disappeared, and the animal in one day was normal in size.—*Dublin Journal of Medical Science.* April, 1880.—J. C. R.

New Reagent for the Detection of Biliary Colouring Matter in the Urine.—The ordinary reagents, nitric and hydrochloric acids, employed for the above purpose, have this inconvenience—that they are available only when the quantity of colouring matter present is considerable. M. Masset describes, in the *Archives Médicales Belges*, a new method of testing, which he regards as much more delicate. Two grammes of the urine to be examined are placed in a test-

tube, and acidified with two or three drops of concentrated sulphuric acid ; a small crystal of *nitrite of potassium* is then dropped in in such a way that it reaches the urine at the bottom without touching the sides of the tube. If the proportion of biliary colouring matter in the urine be large, its presence is at once indicated by the appearance of streaks of a magnificent grass-green coloration ; on shaking the tube this coloration becomes uniform and of a deeper shade of green ; it is unaffected by boiling, and remains unaltered for several days. The addition of water simply diminishes the intensity of the colour.

If the quantity of biliary principles is extremely small, the liquid in a very short time acquires a pale green hue, which is as lasting as the deeper shades. This coloration is easily detected by holding up the tube between the eye and the light, or on looking vertically through the tube and urine against a white background. Normal urine so treated takes on a light rose coloured tint.

This test is well calculated to be of service at the onset of certain diseases, when the ordinary reagents render no assistance ; it is extremely delicate, constant in its indications, and easy of application.—*Bull. Gén. de Thérap.* 15th July, 1880.

Fracture of the Neck of the Femur.—Dr. Bezzi draws attention, in *Lo Spallanzani*, Nos. 1 and 2, 1880, to a sign which is pathognomonic of fracture of the neck of the femur, but which is not generally known. In examining the space between the trochanter and the crista ilii, it will be found that while, on the sound side, the muscles occupying this region (the tensor vaginæ femoris and the gluteus medius) are tense, and offer to the hand a considerable feeling of resistance, they present on the affected side a deep, well marked depression, a flaccidity and diminution of tension, from displacement upwards of their points of insertion.—*Centralblatt f. Chirurg.* 31st July, 1880.

Influence of Tobacco Smoking upon Health.—In the *Revue d'Hygiène* for November, 1879, Dr. Decaisne observes that the excessive use of tobacco causes in some subjects intermission of the beats of the heart and radial artery. Out of 88 smokers who came under his observation during a period of three years, he found 21 cases of intermittent pulse without any organic lesion of the heart. This condition he terms *nicotism* of the heart, and in order to cure it, it is generally sufficient to stop the smoking.

In children the evil effects were more apparent. In 27 out of 38, from the age of 9 to 15, irregular action of heart was noted, accompanied by pallor, inanition, *bruit de souffle* of the carotids, and dyspepsia. Children who smoke exhibit an intellectual sluggishness, and an inclination more or less marked for strong liquors. When the habit is given up these symptoms pass off.

In the *Revue d'Hygiène* for January, 1880, Dr. Delauny, in commenting on Dr. Decaisne's paper, calls attention to the influence of tobacco upon pregnancy. He says that—1. It has a pernicious influence upon the health of children and mothers.

2. It impairs the health of pregnant women and causes miscarriage.

3. It has the same noxious effect upon children weak from their birth.

4. It diminishes the quantity of milk, and alters its quality for the worse, and consequently prevents the proper growth of the child, who, indeed, often dies a victim to his mother's evil habit.—*Dublin Journal of Medical Science*. May, 1880.

—J. C. R.

Ascites Chylosus.—An instance of this extremely rare pathological condition was under discussion at a meeting of the Berliner Medicinische Gesellschaft, held on 12th May, 1880. At that meeting Dr. P. Guttmann showed a specimen of a milky-looking fluid which he had removed, by puncture, from the abdomen of a boy aged 10. The patient had enjoyed perfect health till three years ago, when fluid began to collect in the abdominal cavity; in February, 1880, this fluid, which had the same general characters as that exhibited, was removed by v. Langenbeck. In the following April Dr. Guttmann repeated the operation, withdrawing 6,350 grammes of fluid. When examined, this was found to contain abundance of fat and albumen; under the microscope it was seen to consist of innumerable fine molecules which, on the addition of ether, ran together into unmistakeable fat drops. It was, in fact, simply chyle. Fourteen days later the patient was seized with severe pains in head and neck, became drowsy, and died on 4th May. An abscess as large as a walnut was found in the posterior half of the left occipital lobe of the brain; there was also non-tubercular meningitis in the region of the medulla oblongata. In the abdominal cavity were 2,000 grammes of the milky fluid already described. With the exception of chronic non-tubercular peritonitis, which had given rise to extensive adhesions of the intestines to each other, and to neighbouring

structures, the abdominal organs presented nothing abnormal. No distension of the lacteal vessels was discovered; but the patient had for several days taken no food. The thoracic duct in its whole length was empty and quite pervious. From these facts Dr. Guttmann formed the opinion that in this case the transudation of chyle was not caused by compression or obstruction of the lacteals, but by actual disease, and consequent undue permeability, of the walls of those vessels. The chylous transudation was neutral in reaction, of sp. gr. 1022, and without smell. Under a magnifying power of 350 diameters it showed almost nothing except extremely fine and closely packed granules, with a very few round cells. It was, therefore, obviously chyle which had not passed through the lymphatic glands, otherwise the number of round cells (lymphatic corpuscles) would have been much greater. Chemically, the fluid was found to contain 5·25 per cent of fat, which solidified at the ordinary temperature; it also contained 3·5 per cent of albumen. This latter fact is of physiological interest, as it proves that all the albumen introduced into the stomach is not transformed into peptone, but that a certain proportion of it passes unchanged into the chyle. No trace of peptone or of saccharine ferment was found in the fluid. It is here noted that all the cases of this diseased condition hitherto published (very few in number) are collated and summarised by Quincke, in an article on "Fatty Transudations," in *Deutsches Archiv f. Klin. Med.*; Vol. vi.; in his own case and in all the others the transudation was invariably found to be dependent either on perforation or on compression of the lacteals.—*Berliner Klin. Wochenschrift.* No. 29. 1880.

On some Important Therapeutic Effects of Chlorate of Potassium. By ALEXANDER HARKIN, M.D.—Dr. Harkin states that this drug exercises a most potent influence on all maladies dependent on defective nutrition, secretion, excretion, aeration, and molecular metamorphosis—that it possesses the power of developing vital force in weakened constitutions, of retarding the degeneration of the tissues, and of frequently controlling the too rapid advance of senility due to climacteric conditions. He considers the *modus operandi* to be due to the fact of its two elements being oxygen and potassium, which are indispensable to the formation of healthy blood. When a solution of chlorate of potash is taken into the stomach, a portion—as is the rule with iodide and nitrate of potash—is carried off by the kidneys, another portion passes by diffusion into the liquor sanguinis, the textures, the blood globules, and white

corpuscles, a third may be supposed to part with these equivalents of oxygen in the blood, leaving behind chloride of potassium, which may be detected in the urine as well as in the blood, of which it is an important element. The dose should be a saturated solution, which is one ounce to twenty ounces of water, the patient taking one ounce of this thrice daily. Its efficacy is increased in chlorotic or haemorrhagic conditions by the addition of tinct. ferri perchloridi. As to the tolerance of the drug, only one well marked instance was noted where it produced strangury.

As a lotion, Dr. Harkin has found the chlorate of great value, and when using it externally he always gives it internally; in burns and scalds he has found it specially useful, as also in indolent ulcers, in sinuses in the breast, in strumous abscesses, &c. The above paper was read at a meeting of the Ulster Medical Society, and a discussion took place, at which Dr. Withers mentioned a case in which a large indolent sore had healed under chlorate of potash solution, grs. v to the $\frac{3}{4}$ of water, after everything else had failed. Dr. Browne had found it most efficacious in burns and scalds, and also in mammary sinuses, which were injected according to Dr. Harkin's directions.

Dr. Whitlaw had used the chlorate largely, and did not think that we could get on without it in children's diseases. In tonsillitis and pharyngitis he had found it of service, but he would caution those employing it to stop it after the urgent symptoms had disappeared, as he had found the congestion of the throat kept up by continuing the medicine.—*Dublin Journal of Medical Science*. May, 1880.—J. C. R.

Sloughing of the Bladder following on Injury without Fracture of the Pelvis.—A rather remarkable case was admitted into the Gippsland Hospital some time ago, under the care of Dr. Macdonald. A man was thrown from his horse, and in falling was either kicked in the back or trampled upon. In consequence of this he had retention of urine, necessitating the use of the catheter for several days while on his way down from the mountains where the accident occurred. After his admission there was the opposite state, namely, incontinence, which continued until the time of his death, about a fortnight afterwards. At the *post-mortem* no injury of the pelvis was found, but the bladder was completely destroyed by sloughing, not a vestige of the normal structure being left.—*Australian Medical Journal*. April, 1880.—G. S. M.

THE
GLASGOW MEDICAL JOURNAL.

No. X. OCTOBER, 1880.

ORIGINAL ARTICLES.

ON INFLUENZA: ITS SYMPTOMS, VARIETIES, AND CAUSES, FOUNDED ON SIX YEARS' EXPERIENCE OF THE DISEASE.

By FRANCIS HENDERSON, M.D., HELENSBURGH.

(Continued from page 102.)

III. THE CAUSES OF INFLUENZA, PARTICULARLY THE LOCAL CAUSES THAT HAVE GIVEN RISE TO ITS ENDEMIC PREVALENCE IN THIS LOCALITY.

In the previous portions of this article (in the May and June numbers of this *Journal*) examples have been given of some of the phases of influenza which have been observed during its prevalence in this locality during the last few years; and in the August number attention was, in the first place, particularly directed to the peculiar features of the illness; and afterwards, the nature of the poison, as made known by the character of its effects upon the system and also by the relationships of the complaint, was shortly considered. From a study of the question from both these aspects we are led to conclude that influenza is a form of septicæmia.

In the following pages we propose to discuss the causes of influenza in general, and thereafter we shall invite attention to those local conditions or causes, to which we attribute its endemic prevalence in this neighbourhood. We shall consider the causes of influenza under the following divisions:—

- (a.) The exciting cause, or *materies morbi*.
- (b.) The predisposing causes.
- (c.) The causes of epidemic prevalence.
- (d.) The causes of endemic prevalence.

(a.) *The exciting cause, or materies morbi.*—All authors agree that the exciting cause of influenza is a specific material agent existing in the air. If we are correct in our conclusion that influenza is a form of septicæmia, then the specific virus must consist of septic particles, and we may expect to find it in an active or concentrated state in effluvia or emanations from organic matter in the process of decay. That this is so, is corroborated by the opinion of Dr. C. B. Williams,* who mentions influenza as one of the diseases he has traced to foul air escaping from defective house drains.

The septic particles which are the specific agents of influenza, must further be considered as *organised*. They are germinal particles, analogous to seeds, which, when sown in a fruitful soil, always yield the same product. In no other way can we understand or explain the individual peculiarities which these specific particles are proved to possess by the uniform effect they produce upon the systems of the higher animals.

Many arguments might be advanced in favour of this view, but we shall only refer to one fact which we believe supplies sufficient proof—viz., the fact of infectiousness. Although influenza does not owe its spreading power through a community to infection passing from person to person, still, it is stated by most writers to be to a certain degree infectious,† and my own observations of the illness described in the preceding pages is decidedly confirmatory.

Now, if a complaint is infectious, what does this imply? It implies that the material agent which causes the complaint is multiplied in the bodies of the sick, and is given off exactly as it entered—that is, possessed of precisely the same properties. “This faculty of self-multiplication,” says Mr. Simon, “is eminently one of the characters which we call *vital*

Hence, we must regard the specific virus of influenza as a living organism or germ. Moreover, from a study of its effects, under circumstances favourable for their development, as well

* *Principles of Medicine.* Third Edition, p. 56.

† “If we leave out of consideration diseases communicable by inoculation, such as small-pox, the evidence for the occasional contagiousness of influenza is similar to that adduced for any disease acknowledged to be contagious,” &c.—*Annals of Influenza.* Sydenham Society, page 380.

‡ An Essay on Contagion. By John Simon, C.B. *British Medical Journal.* 13th December, 1879.

as from the admitted affinities and connections of the complaint, we are further led to infer that this particular germ belongs to the class of septic organisms. We think it is highly probable (although this is theoretical) that the germs of influenza constitute one of the many species which are included in the term "the common germs of putrefaction," and that therefore they exist in a greater or less amount in all ordinary air. This view serves, so far, to explain one of the remarkable facts about *epidemic influenza*, the rapidity with which it has been observed to spread across a country or a continent, it may be even against the direction of the prevailing winds. To suppose that the rapid extension of the disease is preceded by the equally rapid production and spread of some *new* and *rare* organism seems inconceivable.

The view that the specific germs are present in all ordinary air, and that, in consequence of some change in the constitution of the atmosphere (which is called *epidemic influence*), they are quickened into activity and become the agents of disease, is surely in all respects more probable.

When scarlet fever is epidemic, its spread can be traced from certain centres of infection. Its seeds are fortunately few and must be propagated at these centres before the disease can be conveyed to other places. But the onward march of epidemic influenza is so rapid, and a whole community is sometimes so suddenly affected, that we naturally conclude that the seeds of the disease are sown broadcast all around.

(b.) *The Predisposing Causes.*—Although the great majority of those attacked are in good health, still, there is no doubt that exhaustion of the vital powers, and particularly weakness and susceptibility of the nervous system, act as predisposing causes. Women after childbirth, and convalescents from acute disease, are liable to be affected; also, persons suffering from depression of system, the result of accidents or surgical operation, showed a proclivity to the complaint.

Again, exposure to cold is certainly a predisposing cause. Of this many examples presented themselves during its recent prevalence; although, on the other hand, illustrations were numerous of persons being attacked who were specially protected from all such influences—such as bedridden invalids. These observations are in harmony with those recorded by most writers on influenza.

(c.) *The Causes of Epidemic Prevalence.*—The specific germs of influenza we believe to be always present in ordinary air; but they do not manifestly affect the health of the community except during certain peculiar atmospheric conditions, when,

in consequence of their intensified energies or rapid increase in numbers, they give rise to wide-spread disease. The effect of this peculiar atmospheric condition is called *epidemic influence*. We suppose (although this is treading on theoretical ground) that one kind of atmospheric condition stimulates the specific germs of influenza, and other states of atmosphere awaken the germs of scarlet fever, and so on. What proof have we that the conditions of the atmosphere affect the growth of these germs? Of the fact that *some* air germs are thus affected there is familiar and undoubted evidence. Thus, *heat* and *moisture* certainly promote the activity of the germs of common bacteria which are proved to be the agents of putrefaction; while, on the other hand, a certain degree of cold paralyzes and arrests their energies. Again, certain *electrical* conditions of the atmosphere influence the living atoms which are suspended in it. Thus, the souring of milk during a thunderstorm is due directly or indirectly to the stimulated activities of the bacterium *lactis*, which has been proved by Professor Lister to be the special agent of this kind of fermentation. The rapid putrefaction of meat during certain electrical conditions is further evidence of how the septic germs are affected by states of the weather.

Let us now inquire what is known regarding the connection between atmospheric phenomena and the prevalence of influenza. There has been much discussion on this point, and, inasmuch as influenza has been *epidemic* in all kinds of weather, some writers seem to doubt whether there is any connection; on the other hand, most observers believe that weather states, or at least meteorological disturbances, have to do with the appearance of an epidemic, although the relation cannot be defined. Of course, no condition or state of weather is the exciting cause of influenza, for that, we have seen, is a material living agent, but weather conditions *may* indirectly cause the prevalence of the complaint by increasing the morbid activities of the matières morbi, and we believe that this is certainly the case. Thus, the influence of a thaw in inducing an outbreak of influenza is undoubted. Speaking during the continuance of the epidemic of 1837, Sir Thomas Watson says, "the present epidemic followed hard upon the sudden thaw that succeeded the remarkable snowstorm of the final week of last year," and he quotes Maertens regarding the epidemic of 1782:—"On a cold night (at St. Petersburg) the thermometer rose 30° Fah.; the next morning 40,000 people were taken ill with the influenza." On several occasions I have observed an increase of the form of illness

here prevalent on the occurrence of thaw. But the essentials of prevalence must be present, otherwise a thaw could not produce an outbreak of influenza. Its mode of action is solely by releasing the living germs (which are the real agents) from a condition of inactivity. For even although the atmospheric condition peculiar to epidemic influenza were present, if the functions of the living agents were paralysed by frost, the disease could not prevail. Moreover, the arresting or limiting influence of frost and the opposite effect of thaw is true more or less of all the zymotic diseases. From these considerations it is apparent that the effect of thaw in causing an outbreak of influenza does not throw any special light upon the nature of the atmospheric condition which is concerned in producing an epidemic of the disorder.

During the last six years that the *endemic* form of influenza has been under observation in this locality, there has been considerable opportunity of forming an opinion upon this question; and I feel very certain that the complaint is intimately associated with weather states and changes, for not only does it become more prevalent during certain kinds of weather, but its course is apparently modified by weather changes in individuals already suffering. The best proof of this was furnished by an observation so frequently made that it could not be attributed to coincidence, that persons simultaneously suffering from the complaint, confined to bed in separate houses, were often observed to undergo relapses or aggravations of the illness on the same days, in close connection, *in point of time*, with recognisable weather changes. Now, as the relapses of influenza did not display any exact periodicity, the inference from such an observation, that there is a connection between weather and influenza, is unavoidable.

It should be understood that the illness which exhibited this association with weather states and changes is held to be endemic influenza, and consequently the aggravations and modifications it underwent from atmospheric disturbances illustrate how an endemic is liable to be affected by epidemic influence. But it is a fair inference that the atmospheric condition which can excite a wide-spread epidemic of influenza is the same in kind, although vastly greater in degree and duration.

From my own observation here, I would say that dampness, coldness, and changeableness, are the weather elements which are most nearly associated with the prevalence of influenza. In what way they severally are connected is a matter of

speculation. It may be that *dampness* acts directly by promoting the growth of the specific germs; while *coldness*, intensified by dampness, may act indirectly by rendering the individual more liable to be affected by the air poison. Again, it may be held that the apparent effect of *changeableness* of weather upon prevalence should be interpreted as an indication that *weather* is not the cause of *prevalence*, but that both *weather* and *prevalence* are the result of a common preceding cause—*i.e.*, subtle atmospheric disturbances and conditions.

Whatever opinion may be held on this subject, there is one *fact*, which we quote on the authority of Sir Thomas Watson, which is full of interest, and supplies a powerful argument for the view of epidemic influenza that has been advanced:—“Meat, sent up by means of a kite, high into the atmosphere, during the prevalence of the disease, has returned putrid.”* This observation surely proves, first, that a peculiar condition of atmosphere is really present during an epidemic of influenza; and, second, that this particular atmospheric condition exercises a stimulating effect on a certain class of air germs—viz., the common germs of putrefaction. Now, the fact is noteworthy that the class of germs so affected is the class in which, for reasons given, we have assigned a place to the specific germs of influenza. Is there not, therefore, a great probability that influenza was epidemic at this period because its specific germs shared the increased activity which the atmospheric condition was the means of exciting among the agents of common putrefaction? Although we know nothing definite as to the nature of the atmospheric state which causes the *epidemic prevalence* of influenza, we cannot doubt its reality.

(d.) *The Causes of Endemic Prevalence.*—It has now been ascertained with certainty that the cause of malarious fever being constantly prevalent in certain localities, is the presence of a microphyte (the bacillus *malariae* which has been isolated and is capable of being cultivated under observation), which is always being developed among favouring local conditions, and whose germs are diffused through the air of the district. Similarly, there is no reasonable doubt that the cause of influenza constantly prevailing in one place is, that its specific germs constantly abound in that locality. Holding the opinion that the specific germs of this disease exist, in a certain amount, in all ordinary air, we must assume that, to give rise to an endemic complaint, they must be

* *Principles and Practice of Physic.* Fourth edition. Vol. ii, p. 47.

present either in excessive quantity, or have acquired exalted powers, in consequence of further development under the influence of their surroundings. We must, therefore, conclude that, if influenza is *endemic*, there are certain local circumstances or conditions suitable for the growth and propagation of its particular germs. Let us now shortly state how these views, regarding the causes of influenza, explain the three different forms of the complaint—viz., the *sporadic*, the *epidemic*, and the *endemic*.

1st. *Sporadic Influenza*.—Cases presenting the essential symptoms of influenza, in a greater or less degree, are very common in all parts of the country. We would ascribe the occurrence of such cases to the germs of influenza (which we hold are present in all ordinary air) becoming active as agents of disease in consequence of the *predisposing causes* having been in operation—exhaustion of the nervous system and depression of the vital powers from exposure to cold. Sporadic cases may also be traceable to the air becoming charged with septic organisms from defective drains, &c.

2nd. *Epidemic Influenza*.—In accordance with the preceding theoretical view, there are two factors in epidemic influenza. First, the specific germs, which are the virus, and second, the epidemic influence, *i.e.*, a peculiar condition of the atmosphere which, while it lasts, endows the specific germs of the disease with intensified powers, and so renders them the agents of a malady which sometimes suddenly prostrates a whole community. This theory is certainly supported by many facts, and seems best to account for the remarkable features of epidemic influenza—viz., the absence of any known source or place of origin, the rapidity of its spread, the steady onward march across continents. These and other characters seem to imply that its *materies morbi* is everywhere present, although probably in variable quantity.

3rd. *Endemic Influenza* is due to the constant presence of the specific germs of the complaint in such numbers, or in such a state of development that they are capable of exciting their specific effects on those residing in the locality without the assistance of *predisposing causes* or of *epidemic influence*, although both these causes may induce or aggravate an attack of the endemic form of influenza.

Passing now from the consideration of the causes of influenza and from endeavours, necessarily theoretical, to state the relation in which sporadic, epidemic, and endemic influenza stand to each other, we turn to the more important and practical part of our subject.

**THE LOCAL CAUSES THAT HAVE GIVEN RISE TO ENDEMIC
INFLUENZA IN THIS LOCALITY.**

We have seen that endemic influenza is caused by the constant presence of the specific germs of the complaint in such numbers, or in such a state of development, that they are capable of producing their specific effects upon the health of the inhabitants of a locality. Moreover, we have seen that the specific germs of influenza are closely associated with the common germs of putrefaction, if they do not actually form one of the included species. And, further, it has been shown that the peculiar form of the complaint, which has been here endemic, has in its most fully developed examples, exhibited the characters of septicaemia. We are thus already acquainted with the *nature* of those causes that have occasioned the prevalence of this form of disease in this neighbourhood, and are thus prepared to inquire into their source or sources of origin. Those who have resided in this locality are well aware of the fact, that an unpleasant smell is generally to be perceived in the neighbourhood of the shore. In certain conditions of the weather it is extremely unpleasant, and is often quite discernible, not merely along the lower ground near the shore, but from a considerable distance off. How far off, depends on the direction of the wind and on the acuteness of the sense of smell possessed by the observer. Moreover, this contaminated condition of the air is not confined to the limits of Helensburgh, but is frequently discernible along the side of the Gareloch, more particularly at certain points, and also up the river towards Cardross. On very calm and warm days, the unpleasant smell is most marked, because the emanations which cause it are permitted to collect, undisturbed by the diffusing and diluting influence of wind. What is the source and origin of this contaminated condition of the air? I answer, unhesitatingly, *it is chiefly caused by the polluted waters of the Clyde.* The sewage and filth of Glasgow, and of the other towns which drain into the Clyde, are brought down by the river to its estuary just above Greenock. At flood tide the water of the river is borne back, and in consequence of the conformation of the land, the resulting currents carry a large body of water across to our shores on the north side of the Firth. Again, at ebb tide, a portion of the water of the river flows between Ardmore point and the bank opposite Port-Glasgow, and is thus directed straight across to the Helensburgh shore. The combined result is that, both during flood and ebb tides, a very constant current crosses from the mouth of the

river to the shore towards the east end of Helensburgh. It then turns westward, passes along in front of the town, and rounding Cairndhu point, turns into the next bay, opposite Ardencaple Toll. From this point it crosses to the narrows at Row point, and passes up the Gareloch, keeping to the east side of the loch. After reaching Garelochhead, it returns by the west side. The general course of this current is well known in the district. Regarding a part of its course, I may quote from the evidence given by Bailie Ure, of Glasgow, before a Select Committee of the House of Commons (in connection with the North British Railway Bill, 1877). Mr. Ure says—"I know for a fact, that from nine to ten hours out of the twelve, the tide is running past Helensburgh, and away down" (up?) "the Gareloch." Another part of the current can be easily observed at ebb tide on any calm day in the neighbourhood of Row pier. When ebb tide is well advanced, the vessels swinging at anchor on the west side and in mid channel, lie with their bows pointing up the loch, but it will be noticed that the vessels which are anchored on the east side, particularly those in the bay to the south of the pier, are lying just in the opposite direction, showing that even during ebb there is a steady current up the east side of the loch. A good general illustration of the course of the current from the Clyde estuary to our shores is supplied by the following occurrence:—Towards the end of last year a ship arrived at the Clyde with a cargo of pigs. On the voyage many of them had been attacked by pig typhoid; and, as the vessel was proceeding up the Firth, many dead and dying pigs were thrown overboard. Four or five of these pigs were found ashore at the east end of Helensburgh, and other three or four were stranded between that part and Cairndhu Point. Six others were cast on different parts of the shore, between Cairndhu and Row Points, and one was carried through the narrows and borne to the east side of the loch, where it was found lying on the beach.

What is the effect of this current? It bears along with it a large amount of the polluted waters of the river, and, as it travels along the course we have indicated, the suspended mud is being constantly deposited. At low tide, abundant evidence of this is to be found. On the extensive stretch of flat shore in front of Helensburgh, there is a large amount of decomposing organic matter, often giving rise to a most offensive odour. In the bay beyond Cairndhu Point, the condition of the shore seems even worse, and the amount of effluvia greater. The adjoining part of the turnpike road is notoriously disagreeable. In this bay the

shore is very flat, and indeed, in places, somewhat hollowed, as shown by the existence for a time of large shallow pools left by the retreating tide. These depressions on the shore are naturally well fitted to prevent the sediment, which falls from the impure water, being carried out again by the ebb tide. At other parts of the loch, as well as at Garelochhead, the shore is also in a very unpleasant condition.

In addition to the evidence based on the course of the currents, and on the general observations of their polluting effects upon our shores, we have exact scientific proof of the fact, that the waters of the Frith in this locality, and up the Gareloch, are largely charged with Clyde sewage. On the 5th of May, 1880, an important paper, by Dr. Angus Smith, of Manchester, was read before the Philosophical Society of Glasgow. At the outset of his remarks, Dr. Angus Smith referred to his previous communication on "The Water of the Clyde," in which it was shown, from chemical analysis, that the water of the upper parts of the Frith, and adjoining lochs, is affected to a very appreciable degree, in ordinary times, by Glasgow sewage. His present paper deals with the relative quantity of the Clyde mud deposited in various parts of the Frith and adjoining lochs. It contains tables of valuable and laborious analyses, showing the quantity of mud in numerous samples, and the percentage of ammonia and phosphoric acid in the different samples.* The mud was obtained from the bottom by dredging. These investigations prove that a very considerable quantity of Clyde mud, rich both in ammonia and phosphoric acid, is carried by currents into this neighbourhood. "There can be no doubt," says Dr. Smith, "that the Roseneath, Clynder, and Helensburgh department is receiving more than its full share of the deposit in a condition that we are inclined to object to, and yet the current deposits the matter curiously. The deposit is not so great at the north end of Row Bay as in the middle, and when we view the rapid rush of water there at times, we can account for it," &c. Dr. Smith's analysis is of the mud at the bottom below low water mark. I have at present no chemical analysis to produce of the decomposing matter which is found lying on the adjoining shores; but surely there is very little assumption involved in the conclusion, that the layer of *putrefying* matter on the shore has the same origin as the *putrefiable* mud in such abundance at the bottom. Indeed, it would be quite astonishing, especially when we consider how the currents bear in upon

* For the exact chemical details, the reader is referred to Dr. Angus Smith's paper, which is now printed.

the north shore even at full tide, if we did not find at low water abundance of the same kind of sediment lying upon the beach.

Putrefiable matter, covered by some fathoms of water, may undergo oxidation so slowly as scarcely to affect the condition of the air overhead. Even sewage matter *suspended* in water may not be injurious to health by its influence on the air, although the evidence on this point, according to Dr. Parkes, is contradictory.*

The case is very different when we have putrefiable matter such as "Clyde mud," rich in ammonia and phosphoric acid, spread out on an extensive acreage of shore, and freely exposed to the air, and occasionally to the direct rays of the sun, during the greater part of every twenty-four hours. Add to this the lifting force exerted by evaporation, and we cannot avoid the conclusion that, besides the escape of fetid inorganic gases, a large mass of organic particles and *septic organisms* of all sorts must be raised from the surface and become diffused in the air of the locality, and that we may trace to this source the constant excess of those specific germs to whose presence in the air we attribute the peculiar form of illness which has prevailed in this district.

While referring to the results of his work, Dr. Smith says, "it may also help to put us on our guard against encroachments of the sewage on the health grounds below, so important to the people of Glasgow," &c. It is certainly a striking circumstance that while from his point of view Dr. Smith fears that the conditions he has discovered may, *in the future*, prove injurious to health, we have been observing and recording, for several years back, the presence of a peculiar form of illness which we think we may affirm to be the offspring of these very conditions.

While holding that the contaminated condition of the air in this locality is chiefly due to the deposits from the polluted water of the Clyde, spread out upon our shore, we do not wish to overlook the fact that at certain places the condition of the shore is aggravated by the local drainage. At Helensburgh the sewage is carried down the shore about 180 yards below high water mark by five iron pipes, and is there discharged. No doubt this is a decided contribution to the decomposing organic matter which renders the shore so unsavoury. If the water of the Frith were itself pure, it would probably be equal to deodorise and completely remove the Helensburgh sewage, but being as it is, we cannot expect this result.

* Parkes' *Op. Cit.* Page 131.

However, we do not attribute much of the contaminated condition of the air to Helensburgh sewage. The quantity is very trifling compared with what is carried to our shores. Besides, the same condition is discernible over a very wide area about Cardross, and at various parts of the Gareloch. Moreover, the nose is most offended at those parts of the shore where we know, from the course of the currents, the greatest amount of Clyde mud is deposited.

If we pass on to Row Bay, we find a very disagreeable condition of the shore, and at times an unmistakable effluvium, associated with really a very small amount of local drainage, an amount, we believe, which would have no effect at all upon the shore if the water of the bay were not already overloaded with oxidisable matter. Farther up the loch there are parts of the shore where the well known odour is easily recognisable, and where the local drainage is practically *nil*.

At Garelochhead there is a large surface of shore exposed at low water. The lower half is largely covered with thick, pasty, tenacious mud. At many places its comparatively recent deposition is indicated by the fact that it is lying on the top of the loose stones and gravel. The effluvium, in certain states of the wind and weather, has especially of late been much complained of. Dr. Dunbar, the medical officer of health for the district, agrees with me in the opinion that the state of the shore and the resulting emanations are quite out of proportion to the amount of local sewage, and must, therefore, be caused by organic matter conveyed to the place by currents. I may add here, that I have attended at Garelochhead many cases of the peculiar form of disease described in the former part of this article, and some of them were both severe and protracted.

As additional testimony regarding the general state of the shore and its result, I shall quote here the opinion of a skilled observer who is not a resident, but who frequently visits in this neighbourhood. "There can be no doubt," writes Mr. Harris Butterfield, the medical officer of health for Bradford, "that the shores of the Clyde about Cardross and up the Gareloch are polluted with sewage. The exposure of sewage deposit at low tide is certain to contaminate the atmosphere, and induce a tendency to low forms of fever, sore throats, diarrhoea, and other conditions which are recognised as being associated with sewage contamination. I quite agree with you that to this cause is due the prevalence of the peculiar form of disease which you have described in your communications to the *Glasgow Medical Journal*."

If it is asked—What are the general results of observation regarding the effect of sewage abundantly spread upon the shore? I can find very little recorded experience bearing on this point. Dr. Parkes says,* "When sewage matter is poured into the sea and washed back by the tide, it may become a source of danger." And he mentions an outbreak of enteric fever which took place among recruits who were employed building a sea wall near the spot where the sewage of Portsmouth is pumped into the sea—"the pumping ought to take place at ebb tide only; it was found that this rule had been neglected, and that the pumping had taken place during the flow, so that the sewage was carried back and deposited on the mud. Out of 130 recruits, 4 died, 16 had distinct attacks of enteric fever, and 40 had *milder attacks of indisposition*."

Besides the contaminated condition of the air of this locality, caused, as we have seen, by the state of the contiguous shores, it may not be out of place to inquire—if there are any other local agencies which might possibly cause or at least contribute towards the prevalence of the endemic complaint we have described? A few words may be said about (a.) The climate; (b.) The water supply; (c.) The house drainage.

(a.) The *climate* of Helensburgh and its neighbourhood is moist and somewhat relaxing, and as *dampness* is one of the weather conditions which seems to promote prevalence, either by favouring the development of the morbific air germs or by rendering the system more open to their attack, it may be held that the climate increases the prevalence of this form of illness. For some years, after observing and recording the peculiar features of this endemic influenza, I was inclined to attribute it to the dampness of our climate, acting in the way just indicated; but during the last few years, and chiefly in consequence of observing the decidedly septicæmic character of the worst cases, the suspicion has been growing into a conviction that the favouring local conditions are of a kind which act by supplying the germs of the disease in large quantity, and I have now no doubt that the material specific virus emanates from our own shores.

(b.) The *water supply* as a possible cause may be excluded—because, *first*, the Helensburgh water is exceptionally good and, indeed, from the nature of its source, is above suspicion: and, *second*, because the complaint is very prevalent beyond the boundaries of the burgh on the shores of Gareloch—at Garelochhead, &c.—in short, at places and in houses where the water is drawn from numerous separate sources. In some

* Parkes' *Op Cit.*, page 132.

houses with a private water supply, in which the illness occurred, the water has been chemically analysed and found free from organic impurity.

(c.) *House drainage.* Looking to the character of the poison of influenza, it is not improbable that, in some cases, sewer air from defective drains might contribute to the commencement or keeping up of this illness, although I have never seen reason in any given case to conclude that this was so. But, as a general cause of the complaint, house drainage may be excluded on the following grounds:—

1st. The wide-spread and general presence of the illness over the whole locality.

2nd. The simultaneous occurrence of numerous cases, apparently in consequence of, or at least contemporaneously with, weather changes; and

3rd. Its occurrence in houses where subsequent investigation proved that the drains were in proper order.

SUMMARY AND CONCLUSION.

For a number of years past, a form of illness has constantly prevailed, to a greater or less extent, in this locality, which falls within the usual definition of influenza; and, like epidemic influenza, it has exhibited various phases, according to the portion of the nervous system, or the part of the mucous membrane upon which the effects of the specific virus chiefly fell. Examples have been given in the previous pages of this article. While the majority of the cases observed would rank as cases of ordinary influenza, a very large number have displayed certain peculiarities—viz., great protractedness, peculiar appearances on the surface of the mucous membrane, peculiar nervous phenomena. These peculiarities were probably due to the same cause which has occasioned the prolonged prevalence of the complaint—viz., the constant presence of the specific poison in the air of the locality, *in effective strength*.

Some of our readers may not approve of the illness we have described being entitled *endemic influenza*, as this involves theoretical considerations; others again, from recognising the septic character of the symptoms which became prominent in the more aggravated cases, may prefer to call the complaint a form of *septicæmia*. Passing over this question as a matter of opinion, or perhaps only of nomenclature, this much will be generally admitted, that the illness we have described is *peculiar in various respects*, and that on this account, as well as on the ground of its prolonged and continued prevalence in

this neighbourhood, it may be inferred that the complaint is connected with *peculiar local conditions*. If the neighbourhood is examined, peculiar local conditions at once present themselves. The adjoining shores are more or less covered with a layer of putrefying matter. The resulting effluvia diffused through the atmosphere are generally discernible by the sense of smell, sometimes at a considerable distance off.

There can be no doubt that the products of putrefaction which contaminate the air from this source are suitable *in kind* to give rise to illness such as we have described. The only question is, Are they sufficient in amount?—Is the poison sufficiently concentrated? This question can only be answered by observing the *effects* produced. Personally I am convinced that the cases of illness, of which illustrations have been given, should, to a large extent, be reckoned among the *effects*. This view is also held by many, who, from prolonged personal observation and special qualifications, are best able to form an opinion. In making this statement, we do not lose sight of the fact that *similar cases* occur elsewhere. This is what we should expect, because the germs of putrefaction (in association with which the specific virus of the complaint, is to be found) exist in all ordinary air, and, moreover, this particular poison is, as we have seen, greatly affected by *epidemic influence*, which is probably independent of locality. But what we hold is, that the extensive and prolonged prevalence—the highly developed symptoms—the protracted course—in short, the *peculiarities of the complaint* are to be attributed to the *peculiarities of the locality*.

We have here two important facts. First, the air of this locality is to a certain degree contaminated by the emanations arising from the adjoining shores; and, Second, for a series of years a form of illness, distinguished by certain peculiarities, has been constantly prevalent in the locality.

Our conclusion is, that these two facts stand in the relation of *cause* and *effect*. If this relationship is real, it follows that the cessation of the endemic complaint can only follow the removal of the cause. To further this end, it is certainly the duty of the Local Authorities concerned not to increase the evil by spreading their drainage upon the already polluted shores, although in my opinion this will not avail to lessen, far less to exterminate this endemic disorder. To effect this, the *purification of the Clyde* will alone suffice.

Meantime, it cannot be questioned that the desirability of this locality as a place of residence is affected by the prevalence of this form of illness. While compelled to make this

statement, it is only fair that I should add, that in other respects the general health is very good, and particularly do I feel warranted in saying, that children thrive well and that the climate is certainly favourable for certain forms of bronchial and pulmonary delicacy.

RESUSCITATION OF A STILL BORN CHILD AFTER STOPPAGE OF THE HEART'S ACTION.

BY JOHN TAYLOR, M.D., EDINBURGH.

MRS. T., residing in Leith, a woman of small and stout build, aged 20 years, fell in her first labour at 8 P.M. on 9th July, 1879.

On examination, per vaginam, during absence of uterine contraction, the external os was found the size of a florin. The sacral promontory was easily reached, but the usual hard cephalic globe was missed in the lower uterine segment at the brim.

The woman was consequently placed on her back, and the bimanual mode of examination instituted, whereupon the real nature of the case became apparent. The outer hand detected the foetal head at the uterine fundus, and, on pains developing, the inside hand detected a long finger-shaped protrusion of the membranes.

Finding on my return next morning at 9 A.M. that the os was dilated to the size of the mouth of a wine glass, and the sacral promontory beyond reach, owing to descent of the breech into the pelvic cavity, I ruptured the membranes and detected the sex of the foetus by feeling the scrotum. The position of the presentation was foetal sacrum to mother's left side.

At 11 A.M., matters being *in statu quo*, I resolved on interference. Obtaining the assistance of Dr. Angus Macdonald, we proceeded, after emptying the bladder and chloroforming, to bring down the left limb by the non-feeling blunt hook, but the impaction being too firm, the thigh bone broke with an audible snap, and the mutilated member being now easily drawn down, the other was more readily extracted, the body was freed after some stout tractive efforts, and we proceeded to observe the mechanism of the delivery of the head, this latter being effected in the unusual position of foetal face to maternal symphysis. The foetus was still born and very

flaccid. Dr. Macdonald and I made a stethoscopic examination of the heart, and finding no pulsation or cardiac sounds of any kind, I wrapped the corpse in a sheet and deposited it under the bed.

It being now noon, Dr. Macdonald left the house, and I extracted the placenta by Credè's method, and applied a binder.

Thinking I had had an anxious case in hand, I sat by my patient's bedside till 1 P.M., about which time I heard a rustling under the bed, and asked the patient if the house was infested by mice. She said, no. But, hearing a repetition of the sound, I became suspicious, and took leave to open up the sheet containing the wounded innocent, whereupon I found, at first, no signs of life, but just while again about to shroud it in its sheet I observed a quivering of the muscles, whereupon I immediately proceeded to artificial respiration and the alternate use of hot and cold water, &c.; these resuscitating measures being continued till 2:30 P.M., I was rewarded by being able to hand a living child over to the nurse, and after dressing and bandaging the lacerated limb I left. Both patients progressed favourably through the puerperal week.

At the end of fourteen days the mother called asking permission to proceed to the seaside. While there the baby contracted pneumonia and died; the mother was then observed by her relatives to become excited and very restless, and on medical examination was pronounced insane, and is now under care in an asylum in Perthshire.

NOTES OF A CASE OF ULCERATIVE ENDO-CARDITIS.

By J. CRAWFORD RENTON, M.B. ED.,
Assistant Surgeon to the Eye Infirmary, and Extra Assistant Surgeon to the
Western Infirmary, Glasgow; and

JOSEPH COATS, M.D.

A. W., *æt. 34*, of average height, but pale and lightly built, came under observation on 13th March, 1880, when the following note was made:—Patient complains that two days ago he had a slight shivering, which was followed by headache, sickness, and vomiting, accompanied by pain over the region of

the liver. The vomiting is aggravated when any food is taken.

Previous History.—Five years ago patient had an attack of rheumatic fever which affected his heart, and since then he has been subject to rheumatic pains. Four weeks ago he had an attack of pain in the knees and ankles, which speedily subsided on the administration of salicylate of soda.

Family History.—Distinctly rheumatic.

Present Condition.—Pulse 120, temperature 102°. Tongue furred. Pain on pressure over the liver, but no increase of dulness. Bowels constipated. No cough or pain in the chest, the cardiac dulness is increased, especially in a downward direction and to the left, and on auscultation a loud mitral murmur is heard. This had been previously noted as a result of the rheumatic fever; the action of the heart is quite regular. Urine high coloured. Patient is advised to keep his bed, and to have linseed poultices applied over the liver; with iced milk or milk and potash water to drink, a simple pill to be given at bed time to move the bowels.

14th.—Patient has been very restless all night and wished to leave his bed. Pulse 120 regular, temperature 103°. Bowels have acted freely, and the vomiting has ceased. Milk is taken willingly.

Evening.—Pulse 120, temperature 104°. Over the chest and abdomen a number of haemorrhagic spots were observed, and the nurse states that his nose bled freely. Two tablespoonfuls of brandy ordered to be given every three hours. Owing to a mistake a sample of the urine was only obtained to-day, and on microscopic examination was found to contain blood.

15th, Morning.—Has had a restless night. Pulse 120, temperature 103·5°. Tongue dry and brown; the purpuric spots have increased in number over the chest and abdomen, and the conjunctivæ are distinctly yellow, as also the body generally.

8 p.m.—Professor M'Call Anderson saw patient in consultation with me, and we found his pulse 130, and temperature 104°. After examining him carefully, Dr. Anderson coincided with me in thinking that our patient was suffering from some form of blood poisoning, its exact nature not being as yet apparent. The absence of any fresh cardiac symptoms, and the presence of slight abdominal tenderness led us to think that possibly enteric fever might be developing. We agreed to recommend a continuance of milk diet, with stimulants, and

sponging the surface of the body with tepid water to reduce the temperature.

16th.—Has had a restless night. Pulse 130, temperature 104°. Tongue dry and cracked. The yellowness of the skin is more apparent. The tenderness over the liver is more marked, and its dulness is decidedly increased. Has had one loose motion, pale in colour, and very foetid. Urine redder in colour, and contains blood and tube casts. There are several large fresh haemorrhagic spots on the feet, and some of those first observed seem to be increased in size. Patient continues to take nourishment well.

Evening.—Pulse 130, temperature 104°. Condition same as in morning.

17th.—After a very restless night patient became visibly weaker, and answered questions very slowly. Pulse weak and rapid, temperature 105°. Professor Anderson saw patient with me, and advised ice to be applied to the abdomen and head, and ten grains of quinine to be given internally. This had the effect of reducing the temperature to 102°, and rendering the patient more comfortable.

5.30.—Patient gradually became weaker, and died.

The *post-mortem* examination, which, being made in a private house, could not be perfectly complete, gave the following results:—The skin was of a generally yellow colour, with numerous red petechiae on face, chest, and abdomen, and to a less extent on the feet. The posterior parts of the body had a generally dusky tint from decomposition, which extended forward some distance on the arms, neck, shoulders, and face.

On opening the chest, the pericardium was found adherent throughout. The heart, with pericardium attached, weighed 13½ ounces, being slightly enlarged. The heart being laid open in the usual way, the aortic and mitral valves were found to be festooned with soft and friable material. This was particularly manifest on the aortic valve, one of whose semi-lunar curtains (the right) had an extensive shaggy mass projecting from it. Where this mass was attached it could easily be seen that the valvular structure was disorganised, and, on removing the soft material, a circular gap was left in the curtain about a third of an inch in diameter. On the other curtains the deposition was mainly at the borders contiguous to that chiefly affected. In addition to these appearances of recent disease, the aortic curtains were generally thicker than normal, and there was also a localized thickening of the endocardium at the base of the curtains, forming a

band half-an-inch in breadth, and extending transversely for a distance of an inch and a half. This had the appearance of a dense tendinous layer, which, like the other white structures of the body, had a distinctly yellow colour. The mitral valve was also slightly thickened, and, when viewed from the auricle, it was seen to be fringed with soft vegetations just within the edges of the curtains.

The lungs were non-adherent, and simply presented oedema in their posterior parts.

The spleen was greatly enlarged, weighing over 14 ounces. Before opening it there were several hard places detected, which felt like infarctions; on cutting into these, fluid blood escaped abundantly, and the splenic tissue was seen to be broken down. There were one or two more solid infarctions with slight caseous metamorphosis.

Both kidneys were enlarged, weighing 6½ and 7½ ounces. In both there were two or three large wedge-shaped infarctions, which presented at some parts a yellow colour, as if from pus. In addition, the kidneys were beset by innumerable haemorrhagic spots, each with a yellow point (pus) in the middle. These were mostly in the cortex, but were also present, to some extent, in the pyramids.

The liver was large and soft, but without any haemorrhagic spots.

The intestines presented numerous blotches of haemorrhage under the peritoneum, and in two or three places there were considerable tracts of intestine of a dark brown colour, which extended through the entire thickness of the gut, and was suggestive of gangrene.

On exposing the brain, considerable subarachnoid haemorrhage was observed on the antero-lateral aspects, and in the brain substance there were a few small areas of softening, which, on section, presented a punctuated red appearance.

The heart and kidneys were examined, microscopically, in the fresh state. The exudation on the valves was found to be largely made up of micrococci, which gave the usual reactions. In the kidneys the yellow dots in the centres of the red spots were found to consist of masses of pus corpuscles, and surrounding the spots there was great hyperæmia of the vessels. It was also seen that micrococci were present in narrow tubes, but the consideration of their relations was deferred till the tissues were hardened. One of the petechial spots on the skin was also removed and hardened in spirit.

A portion of the mitral valve including the exudation, and portions of the kidneys, were hardened in alcohol and chromic

acid, and the following are the results of examination, illustrated by the lithographic plate.

In figures 1 and 2, sections of the mitral valve, with the lesion included, are shown; in figure 1, with a very low power, and in figure 2 with a moderate degree of magnification. It appears that, in the rough projections, two constituents are recognisable. On the surface there is a layer presenting merely a molecular structure, but really consisting, as appears when a high power is used, of fibrine mixed with a granular material. This granular material is in masses or colonies, and by comparison with the more definite aggregations of similar material in the kidneys is readily recognised to be masses of micrococci or bacteria. In fact, this superficial layer is made up of fibrine and minute organisms of the character, as commonly described, of micrococci or globular bacteria. Beneath this layer there are masses of round cells, as shown in figure 2, having very much the characters of granulation tissue, or any other inflammatory tissue. It is to be observed that the superficial layer consists of very soft material, portions of which are easily broken off, and that the layer represented in these figures is small as compared with what originally existed. On one of the curtains of the aortic valve especially, there were large masses of this soft material, which was found in the fresh state, as already mentioned, to be composed largely of masses of micrococci.

Turning now to the kidneys, there were here abundant evidences of embolism. Taking, first, the arteries, there were frequent examples of what is shown in figures 3 and 4. The calibre of the vessel is seen to be obstructed by a material essentially similar to that forming the superficial layer of the endocardiac lesion. We have not here merely micrococci, but a somewhat structureless material in addition, the micrococci being indicated by the darker areas seen especially in figure 3. It is clear that here there has been a direct transportation of material from the valvular structures to the kidney, and it was noticed that the actual plugging had frequently taken place at the bifurcation of an artery, this again being a usual occurrence in embolism. The dark spots and collections of pus, seen in the fresh state, were in connection with these embolisms. Figure 4 illustrates the condition of matters. The artery is shown for a short distance on the proximal side of the plug, and here its coats are distinctly distinguishable. But at the seat of plugging only the general lie of the coats can be distinguished, their constituents being no longer recognisable. In fact, the coats seem to have ceased

to exist as such. Around the artery there is an active inflammation, as evidenced by the enormous aggregation of round cells; these have infiltrated the coat of the artery, and are even penetrating into and partly displacing the plug, as appears at the upper part. The presence of the embolus has apparently led to destruction of the wall of the artery, and to an acute inflammation around it.

Besides the filling up of arteries, there was plugging of two other sets of vessels. In the first place, the Malpighian tufts were frequently the seat of masses of micrococci, as shown in figures 5, 6, and 7. The micrococci here appear to be unmixed with any other material, forming aggregations of granules which, together, produce an exceedingly dark opaque appearance. It is clear that the micrococci are in the vessels of the tufts, their whole arrangement indicating this. It often happens that just a single loop is filled, as in figures 6 and 7, and sometimes the afferent vessel is affected as well as one loop (fig. 7). Sometimes, as in figure 5 (much more highly magnified), there are a considerable number of loops involved. Occasionally, but rarely, a whole tuft is overwhelmed, and stands out as a dark mass in the midst of the more transparent tissue. Besides the Malpighian vessels there is still another set which are filled with micrococci, as shown in figures 8 and 9. There is never any great length of vessel involved, but here and there throughout the cortex of the kidney one meets with a little piece of vessel crammed with micrococci, the vessel being obviously distended by them. The micrococci here, as elsewhere, appear as minute granules, but sometimes with a very high power where the section was very thin, and had happened to lay open the vessel, an appearance such as that shown in figure 9 was presented. Here it is seen that there is not simply a mass of irregular granules, but the mass is composed of homogeneous and perfectly formed globular bodies. After careful examination we have come to the conclusion that the vessels concerned are capillary blood-vessels. In figure 8 the distended vessels are seen to lie between uriniferous tubules, and they are obviously capillaries. We were unable to find any evidence of the existence of micrococci in the tubules, although this has been described by others.

Sections were made of the piece of skin, including the petechial spot, but no embolic appearances were detected. The spleen was much too soft to make it possible to procure consistent sections. In bits removed by the scissors, nothing remarkable was found. Sections of the liver showed enlarge-

ment of the cells with cloudy swelling, and a very marked fatty degeneration, the usual appearances of an aggravated parenchymatous inflammation.

Having now described the appearances presented in this case, it remains to consider certain points in the pathology of the disease. It will be apparent, in the first place, that the diseased valvular structures of the heart supplied to the kidneys and elsewhere numerous emboli. These emboli were of a peculiarly irritative nature, not producing the usual results of the emboli of simple endocarditis, but giving rise, as we have seen, in the kidneys, to multiple abscesses. It is impossible to dissociate this peculiar character of the emboli from the existence in them, and in their source in the heart, of minute organisms—the micrococci. We shall discuss further on the relation of these organisms to the lesions in the kidney, but, in the first place, their relation to the endocarditis claims attention.

In the inflamed valvular structures of the heart, two abnormal constituents, as shown in figures 1 and especially 2, call for explanation. We have a superficial layer of material, consisting of fibrine and micrococci, and a deeper layer consisting of round cells, the usual products of inflammation. The condition differs from that seen in an ordinary acute endocarditis in the presence of the micrococci, and the question at once occurs—Are these organisms to be regarded as the cause of the inflammation, or can they be looked upon as secondary? This question must be considered entirely apart from that of the relation of these organisms to the lesions in the kidneys.

An important point in relation to this question is the fact that, as shown both by the clinical history and by the *post-mortem* examination, this patient had one or more previous attacks of rheumatic endocarditis. There was found, as the report bears, an unusual amount of cicatrical tissue, the result of a chronic endocarditis which had followed one or more acute attacks. The adherent pericardium points to a pericarditis, probably of the same date. The patient had gone through his attacks of acute endocarditis and pericarditis, but without any of those malignant manifestations which finally cut short his life. The presumption from this is that in the present illness the starting point was an ordinary acute endocarditis. The history of the fatal illness bears out this view. The attack of rheumatic fever is stated to have occurred four weeks before the onset of the malignant symptoms, and to have readily subsided under treatment. The same result is

reached by a consideration of the locality of the micrococci. They are found in masses on the surface of the inflamed structures, there being a tolerably distinct line of demarcation between the collections of inflammatory cells and the masses of micrococci. It is as if these had been deposited on the inflamed surface, perhaps adding to the inflammation by their influence.

At the same time, it should be said that although this inference may be drawn from the appearances presented, it is still not quite free from possible fallacy. The disease is here in a comparatively advanced stage of development, and it is very possible that at an early stage the relation of the micrococci to the inflammatory condition may have been much more direct and apparent. In this connection we have to refer to a recent communication by Professor Köster,* in which he asserts that micrococci are concerned in ordinary endocarditis, such as that met with in acute rheumatism. He finds in nearly all cases of acute endocarditis, even of the simplest forms, colonies of micrococci in the exudation covering the inflamed valvular structures, and he seems to assert that the ulcerative endocarditis is only an aggravated form of simple acute endocarditis. He believes that the micrococci circulating in the blood first lodge in the smaller blood-vessels of the valvular structures, forming minute embolisms there, and that the endocarditis is, in this sense, to be regarded as embolic. These views of Köster stand in need of confirmation, but taken along with the facts illustrated in our case, and with the fact that in several recorded cases of ordinary rheumatic endocarditis there have been secondary abscesses developed in the kidneys and elsewhere, it appears reasonable to draw closer the association between ordinary rheumatic endocarditis and the ulcerative form.

There is another relation of this disease which demands a passing notice. In puerperal fever and in pyæmia we sometimes encounter the conjunction of ulcerative endocarditis and secondary suppurations in the kidneys, &c. Eberth † has found in cases of pyæmia with this complication, minute organisms both in the affected endocardium and the secondary abscesses, and is inclined to regard the conditions here and in ulcerative endocarditis as identical, in so far as these structures are concerned. He also regards the organisms in this disease

* "Die embolische Endocarditis," von Professor K. Köster, in Bonn. Virchow's *Archiv.* Bd. lxxii, 1878. P. 257.

† "Ueber diphtherische Endocarditis," von C. J. Eberth. Virchow's *Archiv.* Bd. lvii, 1873. P. 228.

and in pyæmia, as the same as those occurring in diphtheria. According to his view there is in pyæmia a diphtheritic affection of the wound, the organisms penetrating some distance into the tissues, and reaching the circulating blood. In this view of the identity of these organisms with those of diphtheria, Eberth is opposed by certain weighty authorities. In this connection it will be remembered that ulcerative endocarditis is an occasional accompaniment of diphtheria, and when that is the case we may presume that the organisms which have to do with the primary local phenomena are the same in kind as those which find a lodgment in the endocardium. By some authors the relation of ulcerative endocarditis with diphtheritic processes is regarded as so close, that they designate the disease with the name diphtheritic endocarditis. In a case like the present, where the disease had not its origin in diphtheria or pyæmia, it is difficult to understand how the organisms have reached the endocardium. It is possible that such organisms are regularly absorbed from the intestinal tract under normal conditions, but are neutralised by the living tissues. In certain states of disease, however, the tissues may lose their power of destroying these organisms, and so their development is permitted.

The existence of these organisms in the affected endocardium explains most of the other phenomena observed. We have more particularly to consider the lesions in the kidneys. In this regard a very important difference is to be noticed between the conditions presented by the arteries as compared with the other vessels. The plugging of the arteries has in nearly every case given rise to an acute reactive inflammation, while no trace of inflammation could be discovered in connection with the other vessels, unless they were in the vicinity of an abscess. We may bring into relation with this the different constitution and circumstances of the plugs. In the case of the arteries the plug is composed of micrococci and broken down fibrine, in fact, the material is the result of processes which have been going on in the heart. In the Malpighian tufts and capillaries, the micrococci are pure, and they distend the vessels in such a way as to suggest that they have grown on the spot. It is probable that some organisms have attached themselves to the walls of the vessels, and have multiplied there to a very great extent. It is obvious that these organisms are more recent than those which have come direct from the heart. We shall afterwards see reason to believe that organisms exist abundantly in the blood in this disease, apart from massive embolism

from the heart, and it is probable that the plugs in the smaller vessels have their origin in these more isolated micrococci. The plugs in the arteries have frequently produced what appears to be a necrosis of the wall of the artery. Some have regarded this necrosis as the cause of the inflammation, the dead tissue irritating the surrounding structures, and the absence of inflammation in connection with the plugs of the smaller vessels seems to confirm this view. It is clear at any rate that the micrococci themselves are not a serious source of irritation. It is very possible, however, that their products may be so. The organisms in the smaller vessels being of recent growth, have perhaps not had time to produce sufficient irritating material, while the older ones from the heart have carried their products with them.

It is noted in the clinical history of the case, and in the *post-mortem* report, that the skin had a yellow colour. This jaundice was not of hepatic origin, as there was nothing in the liver indicating the reabsorption of bile. It had its origin in the decomposition of the blood corpuscles and the setting free of their colouring matter, the so-called haematogenous icterus. This decomposition of the blood corpuscles occurs also in pyæmia, and is to be related to the micrococci in the blood. It is to be expected that the altered blood will have some deleterious effect on certain of the tissues of the body, and it is a question how many of the lesions found are to be traced to this cause, and how many are embolic. The lesions in the spleen are distinctly embolic, although it was not possible in the soft state of the organ to determine the actual existence of plugs. The lesions of the intestine culminating sometimes in a condition approaching to gangrene, are also in all probability embolic. The petechiae in the skin are possibly embolic, although we were unable to detect the actual plug in the one examined, but they may have their origin in the altered state of the blood. The softenings of the brain are embolic, although the subarachnoid haemorrhage is more probably due to the decomposing blood. The enlargement of the liver is of the same nature as that seen in most acute diseases accompanied by high temperature, and is the result of irritation by the altered blood.

EXPLANATION OF PLATE.

Figure 1. General appearance of exudation on mitral valve, as seen with a very low power, about 12 diameters.

Figure 2. A portion of the lesion of the mitral valve, showing the two constituents, a superficial layer of fibrine and micrococci, and a deeper inflammatory layer, 90 diameters.

Figure 3. An artery plugged with micrococci and broken down fibrine. The darker spots are masses of micrococci, 90 diameters.

Figure 4. An artery plugged. At the upper part the wall is destroyed and partly infiltrated with inflammatory cells, which are in great abundance around, 90 diameters.

Figure 5. A Malpighian tuft, with a number of loops filled with micrococci, 300 diameters.

Figure 6. A Malpighian tuft, with a single loop filled, 90 diameters.

Figure 7. A Malpighian tuft, with the afferent vessel, and a single loop filled, 90 diameters.

Figure 8. Three portions of capillaries filled with micrococci, the centre one greatly distended, 300 diameters.

Figure 9. A capillary filled with micrococci, some of which are partially isolated, and seen to be composed of globular bodies, 650 diameters.

ON THE INHALATION OF CARBOLIC ACID IN DISEASES OF THE RESPIRATORY ORGANS.

By ROBERT MUNRO, M.A., M.D., Kilmarnock.

THE recent publication of two articles in the *British Medical Journal*, one by Dr. J. B. Yeo (20th December, 1879), "On the Treatment of Tuberculosis based on the Theory of the Bacteric Origin of this Disease, as suggested and carried out by Dr. Max Schüller," and the other by Dr. Mackenzie, of Edinburgh (3rd January, 1880), "On the Antiseptic Treatment of Phthisis Pulmonalis," affords me an opportunity of bringing before the profession the result of my experience of a similar mode of treatment which I have practised more or less for the last ten years in various lung diseases. Ever since I commenced the study of medicine, the treatment of inflammatory phthisis, chronic bronchitis, asthma, gangrene of the lungs, &c., by the inhalation of vapours to act either as stimulating lotions, antiseptics, or antispasmodics, according to circumstances, appeared to me so rational that I have given more than ordinary attention to the subject. My first experiments were made with sulphurous acid, creosote, carbolic acid, tincture of benzoin, and various ethers; but, since 1870, I have exclusively adhered, in the suppurating stages of diseases of the respiratory organs, to the simple plan of inhaling the steam from a solution of carbolic acid and hot water.

As my object here is to draw attention to the beneficial effects of this mode of using carbolic acid, I lay aside all theoretical considerations as to the nature of tuberculosis and the mode of action of the acid, and merely state, from an

empirical point of view, some of the circumstances and cases that have led me to put faith in its efficacy.

CASE I.—In the autumn of 1869, J. S., a young solicitor, while spending a few holidays in Arran, was suddenly taken ill with profuse haemoptysis, and, after recovering from the urgent symptoms, his physician ordered him to pass the winter in the south of England. During some months' stay in the Isle of Wight I understand he was pretty well and freely enjoyed outdoor exercise, but after returning home he became worse. It was then he came under my care, and, upon examining his chest, I found that his left lung was much diseased, that it contained cavities, and that he was suffering from all the usual symptoms of phthisis. For some time he was very weak, being confined to bed, and the expectoration increased and became so offensive that his friends found it disagreeable even to enter his room. In these circumstances I recommended the free inhalation of steam from a mixture of carbolic acid and water. This he did three times a day, for about a quarter of an hour each time, and from that day he commenced to improve. The expectoration gradually ceased, the lung soon cicatrised and healed up, and he finally recovered his former health and vigour, which I am glad to say he still retains.

CASE II.—Another case that gave me much encouragement occurred soon after the above. G. H., a young lad, a farm servant, called at my consulting rooms. His health had given way for some weeks previously, and he was obliged to give up work. Upon examination, the lower half of one lung was found to be quite solid, but as to the exact pathology of this condition I could not then form a definite opinion. My impression however was that it was not of a tuberculous character. For about a month there was no perceptible change in his condition, and then he ceased calling for me. Some weeks afterwards, however, I was requested to visit him at his father's cottage. I then ascertained that, in the interval, he had procured other medical advice to the effect that he was dying of consumption. He was now expectorating a large amount of offensive matter. I at once set him to inhale vapour saturated with carbolic acid, after which he made a rapid recovery, and when I last heard of him, some two years ago, he was a coachman.

CASE III.—In 1870 I attended M. B., a young lady suffering from enlarged strumous glands in the neck, which, with change of air, iodide of iron, and attention to diet, gradually became reduced, so that in the course of a few months her

face assumed its normal appearance. A year afterwards her lungs became affected with tubercular deposits, and shortly after my attention was directed to her case, a cavity was diagnosed in the left lung. She passed the following winter at Cannes, but returned home next summer without having received much benefit. From what I had seen and learned during a winter's residence along the coast of the Riviera, while yet a medical student, of the misery and uselessness of sending invalids abroad in the last stages of consumption, I then resolved never to recommend such a change to my patients, unless, judging from the history and progress of the disease, there was a fair probability of their being able to live over the winter and return home. Partly for this reason, and partly owing to a decided aversion on the part of Miss B. to going abroad again, it was decided that she should remain at home during the next winter. In these circumstances my attention was more particularly directed to her treatment, and, along with various other hygienic and dietetic recommendations, I advised the frequent inhalation of carbolic acid. At the end of the winter she was considerably better, and, in the course of the following summer, her cough had completely disappeared. For upwards of two years Miss B. continued well, and got much stouter and perfectly healthy like. She then commenced, though contrary to advice, to go to evening parties, till, on one occasion, having joined in every dance in the evening's programme, she caught cold, and succumbed to a rapid attack of acute phthisis.

CASE IV.—In March, last year, I was called to attend a young lady who was suffering from acute phthisis. The disease had made considerable progress, so that a few days after I had first seen her expectoration commenced, and shortly afterwards several small cavities were detected in the upper lobe of the left lung. Her constitutional history was very unfavourable (her mother and several brothers having died of tubercular disease of the lungs), and from her extreme weakness both Professor Gairdner and I had little hopes of even a temporary improvement. In mentioning the good results I had occasionally seen from the inhalation of carbolic acid, Dr. Gairdner stated that his attention had already been directed to this mode of treatment by Dr. Scott, of Dumfries, and he cordially agreed with me that it should be continued in Miss T.'s case. Notwithstanding her great prostration, caused by heavy expectoration, night perspirations, and diarrhoea, my patient gradually improved, so that in October she had hardly any cough, and was able to visit some friends in England.

Shortly after her return she was taken suddenly ill by convulsions, with severe pain in the head, and tubercular disease of the brain gradually developed itself. This metastasis of the disease continued for two months with the gravest symptoms, such as sudden and acute paroxysms of pain, unequally dilated pupils, imperfect vision (often seeing double), and deep sleep, with moaning. When coma and death seemed fast approaching, active disturbance re-appeared in her chest, and immediately the head symptoms improved, but she quickly succumbed to the fresh outburst in her chest.

CASE V.—In chronic bronchitis the effects of the inhalation of carbolic acid are most beneficial. Patients invariably tell me that they are the better of it. Just lately, a lady, in the course of a casual conversation, mentioned that she was on her way to visit a brother (Captain M., residing at a distance), who was ill with bronchitis, and had been subject to this disease for years, and asked if I could not suggest some remedy as he was now glad to try anything. I gave her instructions how to use the inhalation of carbolic acid, and next time I saw this lady I was informed that her brother never tried anything that did him so much good, and that he had completely recovered in about a week.

CASE VI.—Another young gentleman, to whom I recommended this treatment some years ago, in somewhat similar circumstances, told me lately that it was the only thing that did him good, and that ever since he has been in the habit of using the inhalation of carbolic acid and hot water for ordinary colds, which he says it speedily cuts short. Many others have expressed a similar opinion as to its efficacy in influenza and catarrh of the nasal organs.

Dr. Donald M'Leod (Kilmarnock), writes to me as follows regarding his experience of this mode of using carbolic acid.

Dr. M'Leod's Report.—“For the last six or seven years I have extensively prescribed carbolic acid by inhalation, in the treatment of chest complaints. The affections in which I have had most experience of its use, are:—Chronic bronchitis, bronchiectasis, fibroid phthisis, and gangrene of the lungs. I recommend its use much the same as you advise. It is especially in fibroid phthisis I have seen the happiest result follow its use by inhalation.

“In these cases of fibroid phthisis, accompanied by profuse muco-purulent expectoration, I have almost in every case observed that it lessened the expectoration, consequently allaying, if not subduing, the constitutional disturbance caused

by the accumulation of such material in the lungs and air passages.

"In gangrene of the lung, the foetid and noxious secretion are perceptibly diminished during the first few days of its use; unquestionably, along with stimulants and good nourishing food, in this complaint the inhalation of the vapour of carbolic acid deserves the name *curative*. Possibly this title is applicable to the result of the remedy in this case above all others.

"The administration of remedies by inhalation in lung diseases appears to me so rational, that I often wonder they have not come into use much earlier, especially the vapour of carbolic acid; no doubt, medicated vapours have been long in use, much more so in times past, until the last few years; but the mode of administration was so defective that the practice fell into disuetude. The preparations of tar, so long vaunted in cases of chest complaint, have all been superseded by this, the chief of the remedies used in these complaints.

"In cases of empyema, communicating with the air passages, accompanied with foetid expectoration, I would say that the inhalation of carbolic acid vapour is a highly efficacious remedy.

"I regret I have mislaid a paper containing a description of cases of the different diseases mentioned above, treated by inhalation of the vapour of carbolic acid."

Remarks.—The above are merely illustrative, and by no means isolated cases, in which the inhalation of carbolic acid has proved beneficial in my experience; and although I do not vaunt it as a specific for phthisis pulmonalis, I am certain that it has helped to cure some cases that would otherwise have died. As I commenced to use it at first on the supposition that it acted as a disinfectant and stimulating lotion to the ulcerated and diseased tissues of the lungs, I have only tried it in the second or suppurating stage of phthisis, but of course the real benefit might have been due to the destructive influence of the acid on the bacteric germs. I have observed that little good followed the inhalation unless it was used frequently, and latterly I have been in the habit of seeing that the patient performed the act of inhalation properly, as many were apt to draw the steam merely into the mouth without actually inspiring any of it. Dr. Schüller recommends a solution of benzoate of soda (2 to 5 per cent), to be inhaled by means of a spray producer, two to four times a day, for about half-an-hour each time,* while Dr. Mackenzie practises the

* See *Glasgow Medical Journal*, vol. xiii, p. 340.

inhalation of carbolic acid or creasote by means of a respirator containing a sponge saturated with a strong solution of the drug. I always use the inhalation of steam from a mixture of carbolic acid and hot water (3*i* to the pint), by means of an inhaler, or even a common jug. Whatever the result of a more extended trial of the inhalation of carbolic acid in phthisis pulmonalis may be, it must be borne in mind that its application in this form does not interfere with, nor is it intended to supersede, the use of constitutional and internal remedies.

ON THE REMEDIAL TREATMENT OF THE POST-PARTUM FEVERS OR PUERPERAL FEVER (SO CALLED).

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DURING recent years the subject of prophylaxis of puerperal fever has attracted the best attention and taxed the ingenuity of physicians and practitioners at home and abroad. And, doubtless, if the numerous forms of that malady were capable of being prevented by attention to the principles and practice which have been inculcated with zeal and earnestness, in Journal and Treatise, that desirable consummation would be ensured. At the very best, however, we can only hope to be able to minimise the number of septico-hæmic cases arising from conveyance of the cadaveric, pyæmic, or zymotic viri, or from personal emanations or excretions, by prophylactic measures. However carefully and faithfully these measures are observed, we will never be able to prevent autogenetic and autoinfective cases arising sporadically, if not sometimes epidemically also.

Remedial treatment, therefore, demands all the consideration that we can possibly bestow upon it, and towards perfecting it our intellectual energies are all quickened alike when we think of the painful nature of the malady itself, and of the frequency with which it leaves the babe and children motherless and the husband wifeless.

The main principles of remedial endeavour fall naturally under three divisions, to wit—palliation of symptoms, prevention and mitigation of complications, and general lines of treatment, or empirical methods, addressed against the disease as a totality or aggregation of clinical facts.

Occasionally, in sthenic forms, attempts have been made to abort the fever by administration of emetics, purgatives, or by venesection. The peculiar condition of the uterine system, however, at the onset of the disease, make emetics and purgatives objectionable; and, as a rule, unless where complications set in in an acute form, almost simultaneously, venesection will be contraindicated by the condition of the pulse. Where, however, a peritonitis sets in simultaneously, and in acute form, venesection may be performed; but the bleeding must be pushed *ad deliquium*, or the inflammation will not be subdued, and harm instead of good will have been done. When a fit case, therefore (*prima facie*), for venesection occurs, we should deliberate well, and not unsheathe our lancet until we are prepared to use it effectively.

With the same object, quinine has been used in large doses, but fruitlessly. The writer has given as much as 3*i* at once, with no other effect than that of greatly intensifying the distress of the patient. Albeit, Dr. Cabanellos * advocates its *systematic* use; and, as everything depends upon the manner in which a drug is used, it ought not to be left out of sight in dealing with certain autogenetic cases. I am bound to say that the case in which I used it was probably due to cadaveric infection, and in such a case, probably no drug or line of treatment may ever avail.

Digitalin has been used by Dr. Winkel † as an abortive of "puerperal phlegmon." He says "that as after a chill the prognosis is more favourable when the pulse does not rise above 100," it is evident that a remedy which prevents such rise must be of benefit. It acts on the brain by producing rest and sleep. His formula for the injection is:—

Digitalin, '001 grammie.

Alcohol. et Aquæ äe e.p. ad. 3 grammes.

Fiat Solutio. Dosis, '005 grammes.

A more recent writer, Dr. Netter, writing in the *Révue Médicale de l'Est*, and quoted in the *London Medical Record* for 17th March, 1875, advocates the "injection of a sufficient quantity of tepid water into the peritoneal cavity." He affirms—1st. That the liquid secreted during acute peritonitis has only noxious properties in proportion to its concentration. 2nd. That, largely diluted with water, it loses these properties. And, further—1st. It is possible to cut short acute peritonitis

* *Ranking's Abstract*, vols. xxxv and xxxvi. Arts. 152 and 256 respectively.

† *Loc. Cit.*, vol. xiii. Pp. 281 and 371.

at its commencement by means of injections. 2nd. Since it has become a recognised practice to use injections when peritonitis comes on after ovariotomy, &c., so it should be in the other forms of peritonitis where there is no surgical opening to begin with. The writer is quite of opinion that this revolutionary treatment is *the treatment of the future* for many of the forms of post-partum fever where peritonitis is a leading symptom from the beginning. He is of opinion, however, that in the meantime, unless exceptionally, clearly septicohaemic cases are the only ones in which the method ought to be had recourse to in *the incipient stage*, and as *an abortive*.

We now proceed to see how symptoms may be best palliated and complications mitigated.

The initiatory rigor we are rarely called upon to deal with, because it is often absent or little pronounced, and when severe, it is often over before we have time to reach the bedside. Our main object in dealing with it is to "cut it short," for the longer the rigor lasts the more intense and unmanageable are the internal phlogoses likely to be, and the higher the pyrexia. Fortunately, popular instinct is on our side in this endeavour, though the means used by the people are not always the happiest. Hot demulcent drinks, hot jars and bottles applied to the body and extremities, and increased bed-clothing are the most accessible means. When possible, a diffusible stimulant with two or three grains of opium in gum or Dover's powder, or still better, an hypodermic injection of morphia ($\frac{1}{2}$ to 1 grain) should be administered at once.

Probably the best means we now have of effecting the object in view is by hypodermic injection of pilocarpin nitrate. By its powerful action upon the circulatory organs, the skin, and emunctories generally, it is not only likely to cut short the most severe rigor, but, in an almost miraculously short space of time to liberate the excretions of skin, salivary glands, liver, and kidneys; and thus exert a derivative effect upon all internal congestions. I would advise a dose of at least $\frac{1}{4}$ of a grain to commence with, to be repeated in 15 minutes if all the physiological effects of the drug are not obtained by that time. Morphia may be injected simultaneously if localised pain has preceded or accompanies the rigor. The morphia should not be in more than $\frac{1}{4}$ grain dose, however.

The symptom next in importance, if not in frequency, as a source of danger is hyperpyrexia; and it is now an established rule of treatment to control this by the application of cold in various forms; as by an ice bag to the head alternating with a spinal ice bag; by sucking ice; or the application continuously

of ice cold cloths to the chest, abdomen, and legs, as successfully carried out in a recent and now famous case by Dr. Playfair.* Dr. Wiltshire, again, advocates dry cold, applied to the body in tin pans made for the purpose, and also in india-rubber bottles.† However carried out, the method must be directed to the hyperpyrexia exclusively as a symptom, and must be carried out with firmness and determination, and accompanied by the administration of liquid food and stimulants, together with the fulfilling of any other indication which present symptoms may render necessary or obvious.

Of remedies used internally for the same end, quinine and Warburg's tincture stand first.‡ Dr. Cabanellos, in a paper presented to the Académie Impériale de Médecine (*Med. Chirurg. Review*, July, 1862), states his faith in the efficacy of this drug when given systematically in large doses.§

Salicylic acid has been recommended by several practitioners by reason of its efficacy in rheumatic fever; but I am not aware that any case is on record where it has done good. The writer believes, however, that he has had good results from using salicylate of soda combined as in this formula.

R. Sodii Salicylatis ʒss.
Liq. Ammon. Acet. ʒiij.
Liq. Morph. Hydroch. ʒiij.
Spt. Chloroformi ʒi.
Aq. Menth. Pip. ad ʒx. Misce.

Fiat Mist. cuius capiat ægra cochl. magn. quartis horis.

For hyperpyrexia also, Niemeyer's antipyretic powder is second to none. Containing quinine, digitalis, and opium, it is more specially indicated for those cases where great asthenia is also present. In cases where great asthenia is present *without* hyperpyrexia—[cases frequently the result of heterogenetic toxæmia]—where a profound alteration of the circulating fluid has taken place, rendering reaction difficult, if not impossible—and inflammatory lesions, when present, are of a languid and ill pronounced type—an asthenia accompanied by great depression, praecordial sinking, and uncountable feeble pulse, stimulants and opium are the remedies most to be relied upon. If good is to be got from them, they also must be used heroically and methodically. The amount of alcohol which such patients

* *Brit. Med. Journal*, 17th Nov., 1877.

† *Vide Brit. Med. Journal*, vol. i, 1876, p. 197.

‡ *Vide Ranking, loc. cit.*, and *Brit. Med. Journal*, for 8th June, 1878.

§ Dr. Wiltshire (*loc. cit.*), also advocates administration of a dose of 10 grains of calomel and quinine, followed by 5 grain doses frequently.

can consume without toxic effects is not less wonderful than the amount of opium which may be given to them with benefit. One of the forms of alcohol which has been strongly recommended is the Ess. Menthae Pip.,* and, combined with, or in place of, the Spt. Terebinthinæ, it has given most satisfactory results. It is certain that, when peritonitis and tympanites form prominent features, or occur independently, the Spt. Terebinthinæ administered in some form or combination, and given in large doses frequently, is the most invaluable medicine. The formula which I have most frequently used of late, and which I administered in nearly all the cases tabulated at the end, is this—

R. Spt. Tereb. Rect. $\frac{3}{ij}$.
Ovi. Vitelli. noij.

Misce bene in mortaro et tunc adde.

Muc. Gummi Acaciæ $\frac{3}{iv}$.

Syr. Limon. $\frac{3}{ij}$.

Tinct. Belladon. $\frac{3}{iv}$.

Liq. Morph. Hydrochl. $\frac{3}{ij}$.

Ess. Menth. Pip. $\frac{3}{j}$.

Aq. Chloroform. ad $\frac{3}{x}$. m.

Fiat Mist. cuius capiat cochl. magn. tertiiis horis.

Whenever peritonitis, either general or localised, is a prominent symptom, belladonna and opium are the most reliable agents with which to deal with it. Opium has been long known to exert a powerful influence over peritonitis, but somehow it would appear as if the knowledge had not been properly appreciated or acted upon. In order to get benefit from its use in acute and dangerous cases, it must be given in doses sufficient to *produce and maintain narcotism*. Unless this is done temporary benefit only will ensue. This error I have myself committed, being overshadowed by the fear of inducing too profound and prolonged narcosis. This fear may practically, *in dealing with these cases*, be dismissed from the mind. There is no necessity to produce too *profound* narcosis and so create alarm needlessly; but it is absolutely necessary to maintain a *prolonged* narcosis, once it is induced. I have repeatedly injected subcutaneously as much as 3 grains of morphia hydrochlorate (*Glas. Med. Journal*, July, 1876), in cases of post-partum peritonitis, without inducing even moderate narcosis, but with marked and immediate relief to harassing pain. As the injection was not repeated—*i. e.*, early enough to maintain the therapeutic influence, and as anodyne effects passed off, the distressing symptoms returned, and were not so easily relieved

* *Vide Ranking's Abstract*, vol. xxix, p. 173.

by subsequent injections. Experience teaches, therefore, that having promptly subdued pain and distress by injection of a sufficient dose of morphia subcutaneously, the anodyne influence (and stimulant and sustaining powers) of the drug should be maintained by repeated small injections, or by its administration in combinations by the mouth or rectum.

To show how completely we may dismiss from our minds all fear as to the result of large doses of opium in this disease, I quote the experience of Dr. A. Clark, of New York, as reported in an early number of *Ranking*.*

"1. When a prominent element in puerperal fever is peritonitis, the treatment with large doses of opium is more successful than any other.

"2. To be successful begin early and get system rapidly under its influence.

"3. The dose differs. *Produce a safe degree of narcotism.*"

"5. It will not alone do when leading element is purulent metritis.

"6. The tolerance passes belief. From $\frac{1}{2}$ to $\frac{2}{3}$ of a grain of morphia every two or three hours, generally.

"7. Maintain narcotism till the pain and tenderness subside, and the tympanites diminishes, and the pulse falls below 100; then, *caeteris paribus*, diminish *gradually*, and finally discontinue."

The usual effects, when thus given, are disposition to sleep, but not profoundly, contracted pupil (not always, nor even generally, *when hypodermically administered*), perspiration (often profuse), sometimes a red blotchy eruption (?), diminished frequency of respiration, subsidence of pain and tenderness, slight suffusion of eyes, and, after a time, reduced pulse. The ease with which a patient can be roused from sleep *when a dose is due*, and the state of the respiration, are the guides as to whether the dose should be given or not. If the latter be reduced to 12 in the minute, or should be very irregular or sighing, the dose should be diminished or withheld. The respiratory function gives the most certain and reliable indication of where danger is present. Clark has brought the number of respirations down as low as 7 or 5 in the minute, and *then fatal results have not followed*. Here is a case epitomised. Case No. 7. Given of crude opium 106 grains first day; second, 472 grains; third, 236 grains; fourth, 120 grains; fifth, 54 grains; sixth, 22 grains; seventh, 8 grains; total, 1,018, mostly in hourly doses. Recovery followed. *The*

* *Ranking*, vol. xxii, p. 196.

drug must be given proportional to the hourly exigencies of the case.

Had I not seen similar benefit accruing from large and systematic dosage of opium myself, I would have thought Dr. Clark's experience a romance. His paper, however, bears intrinsic evidence of its being the record of a genuine experience; and my own fully bears out the truth of his observations and the wisdom of the rules he has laid down for guidance in the administration of the remedy. Since he wrote, the hypodermic method has become popularised, and, where possible, it is preferable to administer the drug in this way, so as to leave the primæ viæ undisturbed for administration of adjuvants and nutriment.

Belladonna, as a remedy for peritonitis, whether idiopathic or post-partum, is of more recent date; but recent experience leads to the belief that it is even more specific than opium, when used systematically and in what is considered large doses. The writer has not used it otherwise than in combination as yet, but those* who have relied upon it simpliciter give a very satisfactory account of it. When given alone, it is necessary, as in case of opium, to induce and maintain its physiological effects; and it would appear, from my own experience of it, that when given in combination, it is best given so that its effects shall rise superior to those of the agent with which it is combined. Thus, in prescribing it with opium, one of the most effective forms in which it can be given is with Dover's powder, as thus—

R_r Extract Belladonnæ gr. xij.

Pulv. Ipecac. Comp. gr. xlviij. m.

Fiat massa in pilulas duodecim dividenda quarum capiat unam omni secundâ horâ.

Here the dose of the belladonna is greatly in excess of that of the opium; nevertheless, the combination gives us, clinically, all the anodyne and stimulant effects of the latter, with what must as yet be called the "specific" effects of belladonna on the inflammatory lesion or lesions. The physiological effects of the belladonna are fully produced after the third or fourth dose, when the interval between the doses may be lengthened. These effects may, with propriety, be enumerated here. They consist of the objective phenomena of dilated pupil, delirium of a gay sort, increased number of heart and pulse beats, and corresponding increase of tone in both instances, increased number of respirations, and reduced sudoral function; and

* Dr. Thos. Gilmour, of Pollock Street, at Southern Medical Society. 23rd January, 1879.

the subjective phenomena of dry throat and indistinct vision, and itching of skin. There is probably also increased tone given to the whole involuntary muscular system through the agency of the great sympathetic and pneumogastric nerves.

The delirium and indistinct vision are the guides. After their production they should be maintained till such time as the more urgent symptoms of the fever have passed away.

I am quite certain that in one of my recent cases, that of Miss M'C. (*vide Appendix*), death was averted by this method alone.

In dealing with a complicating peritonitis of the very acute kind, in a sthenic individual, and where the time for venesection has been allowed to lapse, it has occurred to me that other means might be ably seconded by means of a Chapman's hot spine bag applied to the lumbar region at the same time that cold was applied to the abdomen. Dr. Chapman finds that the hot bag causes contraction of the vessels of the abdomen, which effect might be aided and maintained by the direct application of towels wrung out of ice cold water. It appears theoretically probable that a peritonitis or metritis might be successfully combated in this way till, by the use of systemic remedies, the inflammatory tendency has been overcome. Another and perhaps more comfortable way of attaining the same end would be to freeze the abdominal parieties by means of the ether apparatus.

For the relief of the pain of peritonitis, poultices have been prescribed as a routine. This is a practice, however, which, the writer feels, is highly dangerous and cannot be too severely deprecated, as, if the pain be due to an incipient peritonitis, it is amazing with what rapidity it spreads under the fostering warmth of a hot poultice. Care must therefore be taken to make as accurate a diagnosis as possible of the *cause* of the pain; but, at all events, to make sure it is *not* due to an incipient peritonitis. In cases where it can reasonably be construed to be due to any other cause, as, *e. g.*, painful and partial uterine contractions, retention of lochia and clots, cellulitis, metritis, &c., poultices will at once contribute to the relief of the pain as a symptom, and, in some instances, to the removal of the cause by resolution or suppuration, &c. And, again, in cases of completely developed peritonitis, light and often changed poultices are of infinite value for the soothing of pain and promotion of resolution under systemic treatment.

What has just been written regarding poultices might be repeated with regard to leeching. In cases of peritonitis,

unless in the rare case where an adhesion has already formed, I am satisfied leeching only increases the inflamed area and the rapidity of extension, at the same time that it lowers the *vires vitæ*. When abstraction of blood can be borne, as has been previously stated, it is best done by venesection, and a rapid withdrawal of sufficient to affect the pulse—the effect being maintained afterwards by suitable medicines, as, *e. g.*, digitalis alone, or in combination, as in Niemeyer's powder.

The induction or restoration of the lacteal secretion is frequently an object which the physician is desirous to attain, as much for the sake of the reflex action so obtained thereby on the womb as for other reasons. The hypodermic injection of pilocarpine nitrate is likely to prove a valuable means to this end; and where there is hardness and congestion, with tenderness of the mammae, friction with vaseline is at once an elegant and efficient adjuvant to other means in more ordinary use.

In connection with the maintenance of the lacteal secretion, or its re-establishment, a very nice question arises, the answer to which appears to me to hinge almost entirely upon the view which the medical attendant may be able to take as to the etiology of the febrile process in any particular case. Should the infant be put to, or kept at, the mother's breast as usual, or should it be withdrawn and artificial means used for soliciting and maintaining the secretion? When a zymotic or cadaveric etiology is clearly made out, or even when there is a *prima facie* case in favour of it, the infant should be withheld from the breast; in other cases the infant may more properly be put to the breast, always provided that the patient herself desires it, and it does not fatigue her. Under these circumstances the infant derives no harm, and the mother benefits from the rousing of her sympathetic system into more perfect action as well as from a fuller and speedier establishment of the lacteal secretion. When, however, great asthenia is present, or a fatal termination seems imminent, the fatigue of endeavouring to suckle her infant might only hasten collapse, and other means should be adopted for soliciting or maintaining the secretion.

As a matter of course, in cases where it is suspected that the "fons et origo mali" exists in the womb itself, either in the shape of an adherent shred of placenta, foetid membranes, a decomposing clot, or vitiated lochia, the very first and foremost thing to be done is to explore the interior of that organ and remove the "casus mali." The most satisfactory way of doing this is to pass the previously anointed hand into

the womb, and carefully remove therefrom any solid cause of offence; and at the same time, and before removing the hand, to have the interior well syringed with a disinfectant solution—Condy's fluid probably answering as well as most others for this purpose. The womb may be explored in this way as late as three weeks post-partum. Dr. Matthews Duncan* lately recorded a case which was rapidly assuming a grave aspect: but which got better at once after uterine cheiroscopy and the removal of a decomposed shred of placenta.†

The operation, as just detailed, might in many cases be enhanced in value by leaving behind in the vagina a small plug of cotton wool impregnated with glycerine and thymol or iodoform. By means of the former we might hope to initiate an exosmosis of vitiated humors, which, by means of the latter would be at once disinfected.

As a routine practice in cases of incipient post-partum fever, uterine cheiroscopy has much to recommend it. It clears the way so much; as by it we are at once put in possession of a number of facts which, otherwise, we could only guess at. By it we know at once, for instance, whether the temperature of the vagina or womb is heightened; whether there is unusual inflammatory tenderness or swelling at any part; whether the womb is relaxed and flabby or duly and equally contracted; whether it is the subject of flexion or undue fixation. If no offending matter be present, and no abnormal condition whatever, we are then free to look for an explanation of the febrile condition elsewhere.

Uterine cheiroscopy, however, is such a very uninviting proceeding, and so obnoxious to the patient under the circumstances (post-partum) that it is never likely to become a routine practice even in presence of febrile symptoms. As a general rule syringing will be resorted to, not only as a prophylactic, but as a curative measure, and as illustrative of the systematic manner in which uterine injection may be carried out post-partum, I quote the following from three papers by Langenbuch, Schülein, Richter in *Zeitschrift für Geburtsh. und Gynäkologie*, as extracted in *Brit. Med. Journal* for 30th March, 1878.

"Richter's observations were made in the Charité Hospital

* *Vide Brit. Med. Jour.* Vol. ii. 1877. Pp. 257 and 583.

† In performing this operation, care must be taken lest, in the desire to render it complete, too great a shock be inflicted upon the patient. Since writing the above, I have met with a case where a small portion of placenta was gripped by an irregular contraction of the womb, and I had to abandon attempts to get it away owing to patient showing symptoms of collapse. She is doing well. It was not a case of puerperal fever.

at Berlin, where, especially after complicated labours, injections into the uterus were made for prophylactic purposes, and were continued throughout the puerperium. In all, about three thousand injections were made. The carbolic solution most frequently employed was a 2 per cent solution. At first, a 3 per cent solution was used; but, if repeated frequently, it was reduced to 2 per cent, as the former often caused carbolic acid to appear in the urine. Considering the numerous complications, the results were very favourable, being a mortality of 1·6 per cent of all the women delivered, and of 4·83 per cent among the cases in which the injections were used. Schülein, in the University Obstetric Clinic of Berlin, in the winter *semester* of 1876-77, treated two hundred and six out of two hundred and eighty-seven lying-in women immediately after delivery by prophylactic injections of the uterus with a 3 per cent solution of carbolic acid. This injection was employed whenever in the lying-in bed frequent rises of the pulse and temperature occurred. A glass tube was at first used, and a double current catheter afterwards. Under this treatment, with eighty-one cases of illness among the two hundred and six, or 28 per cent, the deaths amounted to only seven, or 2·4 per cent; only one occurring from septic causes, one in a woman on whom Cæsarean section had been performed. Langenbuch has since 1872 employed drainage of the puerperal uterus in order to afford a free outflow of the secretions. His experience shows that this treatment is quite innocuous. In one case, the drain remained nineteen days *in utero*. He recommends this treatment where septic infection already exists, in order to prevent a new invasion of septic material; and also as a prophylactic measure when the cases seem to offer a doubtful prognosis."

The practice of uterine aspiration has been advocated by no less an authority than Dr. Guérin of Paris, and a special apparatus is described for the purpose. The method, however, is so clinically inconvenient of adaptation, that it is never likely to supersede other methods just described.*

Tympanites is a symptom which frequently calls for separate treatment. It is most frequently present as the result of a paralysed condition of the bowels in general peritonitis, but it may occur in the course of any post-partum fever independently of peritonitis. The turpentine mixture of which a formula is given above is the best remedy so far as drugs are concerned. It may be fitly administered as an enema likewise. I have frequently tried the passing of an O'Beirne's tube into

* *Vide Ranking's Abstract.* Vol. xlvi. Art. 251.

the large intestine, but with scant success, *anything* but flatus escaping. In fact this is a useless method.

Puncture of the colon in the right iliac fossa seems to be the only treatment which is effectual, as it is also the best. It is necessary that the aspirating needle should not be of too small a diameter, else the result may be disappointing, a fresh gaseous secretion or formation taking place as fast or faster than escape takes place. It is well also to have a broad bandage passed round the body before the needle is introduced, so that pressure may be brought to bear on the tympanitic abdomen, for atmospheric pressure does not seem to be sufficient in some cases to overcome the inertia of the intestinal and abdominal walls. However that may be, it has at least happened to the writer to pass an aspirator needle into the colon of a tympanitic patient, and get no relief to the tympanites. As it has been proved over and over again, however, to be quite a safe operation, I think no one should rest satisfied until the distension is relieved.*

Gastro-bilious symptoms are sometimes so prominent a feature of post-partum fever that they have given rise to the erection of a distinct type, termed the gastro-bilious (puerperal intestinal irritation of Locock). When the symptoms supervene early, the indications are promptly to aid the efforts of nature by exhibition of smart stimulating emetics or cathartics, followed by demulcents, and then derivatives and sedatives. The hypodermic injection of pilocarpine, accompanied by administration of bismuth and hydrocyanic acid and morphia, will probably fulfil the latter indications better than any other method that can be thought of. Hot applications to the surface will be a suitable adjuvant, with the addition of capsicum or mustard cataplasms over the stomach if relief is not obtained by these means in the course of a couple of hours. Then, as soon as the chylopoietic tract is in repose, the mist. tereb. c. belladonnâ should be administered.

Hydrosis was the title given by Ramsbotham to what he considered a distinct form of post-partum fever. It is regarded by Leishman as a symptom only. Certainly it is the symptom in many cases; but, except for the adynamia with which it is accompanied, it does not call for very special treatment. The turpentine and belladonna treatment is peculiarly applicable, as the one stimulates whilst the latter modifies the excessive sweating. The adynamia must also

* *Vide "Experience," in Glasgow Medical Journal, July, 1876.* Injections of cold water into the bowels are recommended by Schülein. *Vide for this Med. Chirurg. Review for October, 1845.*

be relieved additionally by specially devised nourishing soups and enemata, and the administration of wines rich in tannin.

Phlegmasia dolens and phlebitis are the symptoms which typify another class of post-partum fevers (the embolic or thrombotic) by no means the least accessible to therapeutic means, when the vessels engaged in the inflammatory process are not too numerous or of too vital importance. When the inflammation attacks a vessel like the vena cava or any of the large veins in organs such as the liver or lungs, or when the embolon is arrested in a cardiac or cerebral artery, death, and a rapid death, are almost inevitable; but, when arteries and veins of small calibre, or of larger calibre, if in relation to extremities, are the seat of disease, a favourable issue may be looked for as the result of judicious and assiduous treatment. In addition to general treatment already laid down, rest and application of warm fomentations to the affected part will be necessary. Of these rest is perhaps the more essential. In phlegmasia the limb must be wrapped in addition in cotton wool, in order that its temperature may be maintained. The general principles which should govern the treatment of phlebitis generally have been admirably illustrated by Mr. Savory, in an article in *British Medical Journal*, 2nd February, 1878.

Metritis or hysteritis, with which, so far as treatment is concerned, may be associated pelvic cellulitis, is a frequent complication of post-partum fever, as well as an acute or chronic sequela of parturition and abortion. In whatever connection it occurs, local abstraction of blood is indicated; the application of poultices to lower part of abdomen, and tepid disinfectant injections into the vagina, and when the os is patent, into the womb. The introduction of a tent of cotton wool, soaked in glycerine as before mentioned, is very necessary. Soothing pessaries may be fitly introduced into the vagina and rectum.

In addition to medicines previously mentioned, aconite is a very useful auxiliary in sthenic cases.

When the uterine venous system seems to be the centre of mischief, a general septicohaëmia is likely to supervene. Assiduous poulticing is the best means of localising and focussing the mischief. As soon as an abscess can be made out, it should be evacuated by the aspirator.* It is probable, however, that when metritis terminates thus, it is the lymphatic instead of the vascular system which has been mainly involved in the inflammatory action; for, as Virchow has pointed out, inflammation of the lymphatics bars the entrance

* *Vide Article by J. Bell, in Lond. Med. Gazette. Dec., 1845. P. 1410.*

of infected material farther into the blood. The principles and the mode of treating this complication, however, are the same, whether the uterine stroma, vascular tissue, or lymphatics be specially affected.

When metritis passes the acute stage and enters upon the chronic, the most effectual way of dealing with it is to apply blisters about the size of a crown piece to each iliac region alternately.

Vaginitis is another and a rarer form of complication of post-partum fevers; and becoming rarer every year as the enlightened use of forceps becomes more and more extensive. It more frequently exists as an independent affection than as a complication. The treatment consists in removal of sloughing tissue when present, and with care; the use of warm soothing injections; separation of inflamed surfaces by means of Iceland moss in poultice roll; and insertion of pessaries containing opium, lead and opium, or zinc oxide, &c. Carbolic acid oil should also be used for the limitation of sloughs and stimulation of unhealthy granulations.

Metastatic inflammations will, of course, call for the treatment specially indicated by locality and the condition of the patient. Pleurisy, first of one side and then of the other, is not unusual when peritonitis has been the leading feature of the disease from the beginning. In such cases, if the kidneys be sound, free and speedy vesication of the chest wall is unquestionably the sound practice; at the same time that every means is taken to support the strength. If the kidneys be not sound, capsicum or mustard rubefacients should be used instead of empl. lyttæ as the counter irritant.

Notwithstanding all the resources of therapeutics and surgery, frequent cases have arisen heretofore, and doubtless will arise hereafter, to baffle the ingenuity of the most anxious, most expert, and experienced practitioners. The percentage of deaths arising from these fevers is very difficult to estimate owing to the nosological confusion which has hitherto surrounded them. Well ascertained cases are on record, where no less than 9 out of 10 have been lost in private practice, and so appalled is the professional mind now in presence of this dire scourge that no sooner is the diagnosis beyond doubt than a fatal prognosis is regarded as almost inevitable. We ought all to struggle against this state of mind, however, as it paralyses effort all round—even the efforts of our own minds to devise and invent. Every energy should be put forth towards infusing hope into the immediate attendant or nurse, and to select and devise remedies for every

case. The most hopeless looking cases have occasionally recovered; and the knowledge of this fact should stimulate all our faculties when in presence of similar cases.

As an Appendix to this paper, the writer has tabulated his experience of puerperal fever during the past three-and-a-half years, and it will be seen from it that many cases have recovered notwithstanding their occurrence under the worst possible hygienic surroundings, and, so far as it is possible to judge, by the sole influence of the medicines employed backed up by the *vis medicatrix naturæ*.

A study of these bad cases necessarily issues in the formulation of certain general propositions by the mind of the student. One of these is that if the tendency to death can be averted for four or five days after the initial rigor or onset of the disease, the prognosis is *de facto* greatly more favourable. Another would be that, granted the accomplishment of the fundamental of the first proposition, the treatment of the fever then practically resolves itself, in most cases, into the treatment of some one or other of its complications. And a third would be that none of these latter tax the resources of the practitioner more thoroughly than the most frequent of all—viz., peritonitis.

Now, in view of recorded experiences, not only of this disease but of the results of antiseptic treatment of ovariotomy, performed occasionally during an accession of peritonitis,* of colotomy, gastrotomy, hysterotomy, and, finally, of operations, such as that undertaken by Nussbaum, for formation of an artificial ureter,† we are justified in asking, when other means have failed us (and particularly in view of the inevitable death, otherwise, of our patient), whether we ought not to interfere surgically with the peritoneum. This might be done by making an incision into the pouch of Douglas through the roof of the vagina, and establishing and maintaining drainage therefrom, which might be done by means of a vulcanite canula properly and specially constructed, or by a bundle of catgut (antiseptic). Then, possibly, bland injections, impregnated with thymol or iodoform, might be thrown into the peritoneal cavity. And, finally, if favourable symptoms did not speedily manifest themselves after this proceeding, I see no reason why the peritoneal cavity should not be entered from above—still with antiseptic precautions—and an endeavour made to wash down all the poisonous inflammatory exudations by means of bland weak glyceroles,

* *Vide Brit. Med. Jour.* 11th May, 1878. Lawson Tait's case.

† *Med. Times and Gazette.* February, 1876. P. 390. *Med. Chirurg. Rev.* February, 1876. P. 487.

impregnated with subtle antiseptics, such as thymol and iodoform. Care would have to be taken not to delay these measures too long, till necrosis of the intestines rendered them utterly hopeless; and though those cases, *a priori*, would be most benefited wherein the exudation was not plastic, it is not likely that the plastic exudation cases would be injured by the proceeding.

This method, I find, was advocated by Dr. Bennett of London (*Ranking's Retrospect*). He tapped repeatedly, and finally introduced a double canula into the peritoneum, through which, by means of an india-rubber tube and an elevated reservoir of solution of common salt in warm water, the abdominal cavity was washed out till the issuing fluid ran away quite clear. He instances one case of recovery.

The post-partum septicohæmic fever is the most distressing of all the types. It is doubtful whether anything further could be suggested in the way of treatment special to this type. The inhalation of a carbolised atmosphere has been advocated by Wood (*Practitioner*, vol. vi). Packets of McDougall's powder are to be placed about the bed and bedroom, and suspended under the bed-clothes, &c.

Probably surgical intervention, as advocated by Dr. Netter, and already alluded to more than once, will be found to be the only effectual way of dealing with it. I venture further to make quotation of Netter's conclusions, which I homologate, having arrived at the same before reading his papers. He does not believe in septicæmia (*i. e.*, caused by puerperal peritonitis, *pur et simple*), but considers that the effusion acts as a local irritant poison; and, *as a corollary and an ascertained clinical fact*, that the injection of an abundant supply of warm water to dilute and render harmless the poison is alone required. Moreover, on the authority of Nussbaum, he points out that the injections during the first few hours are those which do good, as after this the fluid effused is more dilute and less irritating. He compares the fluid first effused to the acrid mucus discharged from the nostril at the onset of coryza.

The indication then being to get water of a pure description and warm temperature into the peritoneum, How is it to be fulfilled? Either by direct incision, by absorption, or injection into the veins. Of the three modes the first is certainly the most practical, and he considers "it would not only be justifiable, but right, in cases of acute peritonitis, to make a small opening into the peritoneal cavity, and inject sufficient tepid water to thoroughly dilute its contents and form an

artificial ascites. If relief followed, the injection should be repeated."

The operation is here advocated to be performed at the moment of invasion, before adhesions are formed, as he considers, and justly so, that these adhesions are a cause of the extreme gaseous distension and consequent dyspncea and collapse. If the injection alone did not separate these adhesions, he would aid their separation by simple punctures to let out the gas.

No directions are given as to the after treatment of the wound; but, from the fact that he advocates the leaving of the wound open after herniotomy for drainage and injection, we may conclude that he would follow the same practice after incision for peritonitis.*

The best method of subsequent dealing with the wound will have to be ascertained in the course of experience. It is probable, however, that drawing the edges of the wound accurately together by means of salicylic acid court plaster, and applying over this a compress of carbolised tow, and retaining in place by means of a good binder, will answer as well as any. This would not preclude the reopening of the wound if necessary, whilst it would certainly keep the wound antiseptic.

Experience must also teach us how to proceed in different cases—how to supplement the injection by combined antiseptics, drainage, and more extended incisions.

I doubt not that ere another decade passes away this line of treatment will be no novelty; and I have as little doubt that it will be the means of saving many a life which needs must have otherwise perished.

With reference to the tapping of Douglas' pouch from the vagina, it must be remembered that Barnes' researches have shown the lowest part of the pouch "is not directly behind the uterus and vagina, but distinctly on the left side."†

Case No. 3 of my "experience," recorded in the *Glasgow Medical Journal* for July, 1876,‡ first impressed upon my mind as a fact, and subsequent experience has only tended to confirm it, that the septicohæmia of the post-partum state is frequently due wholly and solely to the absorption of the inflammatory exudations into the peritoneum. To my mind it is therefore a plain therapeutic indication in such cases if

* I do not follow him here, however, as antiseptic precautions should be followed in all these cases.

† *Dis. of Women.* Churchill. 2nd edition. P. 24.

‡ *Vide Appendix "C."*

they do not appear to yield immediately to means herein-before recounted (and by "immediately" I would be held to mean not more than 24 hours), to dilute the primary effusion, and at the same time, if possible, to render it antiseptic by suitable agents.

Experience can alone determine which will be the best method of fulfilling this indication; as, e.g., the locality of incision into the peritoneum, whether one or more, whether abdominal or vaginal, the amount of fluid to be injected; whether pure water at temperature of body, or water containing various resolvents in solution; whether the artificial ascites should be maintained for a time, or whether evacuation should follow close upon injection.

In this relation, however, I beg to refer to a very interesting paper by Dr. Baizeau, in the *Archives Générales de Médecine* for February, 1875, and quoted in the *London Medical Record* for 31st March, 1875. Therein he relates two cases of peritonitis occurring in children, and resulting in spontaneous evacuation of pus from the umbilicus, and both finally cured by injection through the natural opening of a solution of iodine and potassium iodide. This was the formula:—

Rx. Tinet. Iodi, 3viss.
Potass Iodidi, gr. xv.
Aqæ ad. 3xij. m.

Fiat Injectio.

The injections were frequently used twice daily. One of the cases was complicated by pleuropneumonia first, and secondly by pleurisy.

Again, in Ranking's *Abstract* (Art. 204, vol. xxxvi), a case is narrated of a puerperal, æt. 24, who left her bed the day after delivery, and was seized with peritonitis and pleurisy. The peritonitic effusion became purulent, but was spontaneously evacuated after paracentesis, and a recovery ensued.

These cases show that even purulent inflammation of the peritoneum, albeit accompanied by serious chest complications, is not so much to be feared, or so deadly in its issue, as absorption of the newly effused ichor from a recent peritonitis, whether the latter be primary and the result of traumatism or sequent to septicohaëmia or transformed zymosis.

In conclusion, and to sum up, I would venture to say that the successful treatment of the group of pyrexial diseases hitherto known under the common term "puerperal fever," lies in—A. The successful treatment of the initial rigor, when present, with the view specially of limiting its duration. The

therapeutic means at our command for this end are the hot blanket bath and local derivatives, hot drinks, and the hypodermic injection of pilocarpine nitrate with or without morphia and belladonna, according to the presence or absence contemporaneously of peritonitis or some other acute inflammation.

B. The limiting of reaction after the rigor and derivation of local congestion to non-vital parts; by venesection, digitalis, Niemeyer's powder, salicylic acid, quinine, cataplasms, and poultices.

C. Cleansing primæ viæ (unless contraindicated), palliation of vomiting, purging and pain, if present, and cleansing and disinfection of genital canal and uterus.

D. By systematic treatment adopted for the palliation of the most prominent complication present in individual cases, but most specially by reduction of hyperpyrexia, when present, and administration internally of turpentine and belladonna in large doses, more particularly where the peritoneum and uterus are inflamed.

E. Surgical means of relief and cure.

APPENDIX (Condensed).

During the past three and a half years I find I have had no less than 15 cases of post-partum fever amongst parochial patients. The women were all attended, either by midwives, neighbours, or medical students from the Maternity, and I was called to see them at periods varying from the fourth to the ninth day post-partum. I append an account of these cases, and also of 7 cases which occurred in private practice; two being attended during accouchement by myself, and five by other practitioners. These cases, but specially those occurring in parochial practice, exhibit the marvellous therapeutic powers of belladonna and turpentine when given in large doses. They prove that if we treat cases of post-partum fever fearlessly and systematically, even under the most depressing circumstances of present symptoms and hygienic surroundings, the results will be such as no one need be ashamed of. They bring into relief also, the fact, that the poor and wretched seem to pull through these illnesses spite of bad nursing, bad food, foul air, and insufficient clothing, as well as the well-to-do and rich, provided they have the advantage of well devised medicinal treatment. This is a fact weighted with meaning for us, and should be a warning to those who are inclined to overfeed pregnant and puerperal women on the one hand,

and those who are saturated with disbelief in the efficacy of remedies on the other.

Seven cases of puerperal fever have come under my treatment privately, during the past three and a half years, and 15 pauper cases. None of these have been consecutive or had any connection the one with the other, so far as I am individually concerned. The private cases have been widely separated topographically; but the pauper cases have all occurred within the limits of the 3rd and 4th districts of the City Parish. Only one of the private cases was accouched by myself, and none of the pauper cases.

The private cases may be thus epitomised.

CASE 1.—N. M., æt. 36, multipara, residing at 69 Brown Street. Leading complication—Metritis (autoinfective). Cause.—Miscarriage and sequent chill. Treatment.—Poultices to abdomen. Mist. terebinth. et belladon. and occasional Dover's powder. Vagina and uterine cavity assiduously syringed by one of Mrs. Higginbotham's nurses. Result.—Perfect recovery in about four weeks.

CASE 2.—Mrs. J., æt. 22, primipara, 29 Devon Street. Leading complications—Peritonitis, iliac phlebitis, phlegmasia dolens. Accouched by myself. Severe post-partum haemorrhage, controlled by cold douche and ergot. Therapeusis as in No. 1. Leg wrapped in cotton wool. Result.—Perfect recovery in about two months.

CASE 3.—Miss M'C., primipara, æt. 22, 234 Pollokshaws Road. Leading complication—Peritonitis, autogenetic (? idio-pathic). Patient had been in labour for three days prior to my being called to her. Found abdomen very tender to touch on the left side. Pulse 130, and respirations 20. Delivered at once by long forceps, head being at brim at the time, and os dilated to size of crown piece. Live male child born. Treatment. Placed at once on gr. i extr. bellad. every three hours, with febrifuge. Vagina syringed with Condy. Fairly convalescent in a week. Relapse. Treatment repeated with inj. morph. hypoderm. (1 grain each time) night and morning. Result.—Perfect recovery in three weeks. Nursed infant.

CASE 4.—Mrs. M'L., æt. 34, multipara, Cumbernauld. Leading complication—Pelvic cellulitis. Not seen by me till four weeks post-partum, when an abscess was diagnosed in left broad ligament. Three weeks afterwards this was aspirated, and about 4 oz. pus taken away. The patient was a leuco-phlegmatic, and *very curiously had a syphilitic infant, though no trace of syphilis could be found in her or her husband, or antecedent family.* Therapeutics. Tonic and nutrient. Con-

tinuous poulticing and two blisters. *Result.*—Well in seven weeks.

CASE 5.—Mrs. L., 30, multipara, Polmadie. Leading complication—Peritonitis (secondary). A typical case. Not seen by me till ninth day, when all most unfavourable symptoms were present. Treatment. Injected uterus and vagina, with Condy, at once, and ordered this to be done every eight hours. Poultices to abdomen. Mist. tereb. belladon. and hyp. inj. of morphia. Enema of castor oil and spt. terebinthinæ to relieve tympanites. Enemas of brandy, beef tea, &c., &c. Ice. Febrifuge to replace M. tereb. bellad. Quinine. *Result.*—Perfect recovery in 21 days.

CASE 6.—Mrs. M'M., æt. 32, multipara, 90 Pollokshaws Road. Leading complication—Pyrexia. Accouched by self, 14th February, 1879. Did well till fourth day, when, sitting up in bed to suckle the infant, was seized with violent pain in the back and a prolonged and intense rigor. It was found that her bed lay in a draught between a used and an unused fire-place. Happening to be at hand, I administered 2 grains gum opi. before she was well out of the rigor, and ordered a warm drink. In half-an-hour after she had 2 grains extr. belladonnæ, and afterwards the Mist. tereb. bellad. *Result.*—Well in 10 days.

CASE 7.—Mrs. W., 27, primipara, Cumbernauld. Leading complications—peritonitis and bronchitis. Not seen by me till the eighth day, post-partum, when patient was practically moribund. The bronchitic complication appeared to be the really fatal one, but unfortunately she did not receive the possible benefit derivable in such cases from having the womb syringed. Mrs. L., for instance (No. 5), exclaimed immediately after this operation, that "she felt greatly better;" and her case, barring the bronchitis, was every whit as hopeless looking as Mrs. W.'s. In the latter case, however, I had no time to perform the office myself, and the local medical man absolutely refused to do it.

The parochial patients, to the number of 15, ranged in age from 17 to 36, included 5 primiparæ and 10 multiparæ, and all lived in the lowest and dirtiest places of Glasgow. The leading complications were—1 metritis; 1 purulent metritis; 1 metroperitonitis; 9 peritonitis; 1 septicohæmia; 1 phlebitis (presumably cerebral); 1 phlegmasia dolens. Of these, one died on the fifth day, and one on the 12th (septicohæmia and peritonitis respectively). The mode of death in the latter was by asthenia.

Two cases were sent to hospital, and so lost sight of; and

the remaining 11 all recovered within a period varying from eight days to nine weeks.

In two cases the symptoms were worthy of remark. In phlebitis (presumed cerebral) there were intense cephalalgia, rapid pulse, insomnia, and a condition verging upon mania at times. In case 12 (metroperitonitis) an abscess formed between the pouch of Douglas and the rectum, and discharged per ano. Salicylate of soda was used with benefit in this case.

I can say little about the etiology. Four cases had been attended by students from the Maternity, and of these two died and two recovered. The rest were either unattended at period of accouchement or had midwives. So far as possibly could be ascertained, none of these cases were due to the conveyance of heterogenetic contagium. Premature upgetting, and attempts to work, and neglect of personal and domestic hygiene, were the most frequent active etiological factors.

The treatment of all went upon the lines laid down in the body of the paper. Personally, the patients received very limited attention from myself; and their nursing, save in two cases tended by Mrs. Higginbotham's nurses, was simply the worst that could possibly be imagined.

CASE OF INTESTINAL PERFORATION IN ENTERIC FEVER.

UNDER THE CARE OF JAMES W. ALLAN, M.B.,
Superintendent and Physician, City of Glasgow Fever Hospital, Belvidere.

DANIEL M., æt. 28, admitted 12th August, 1878, on ninth day of illness. The history was briefly—frontal headache the first thing. After a dose of citrate of magnesia he seems to have collapsed. After this, more aperient medicine—blue pill, seidlitz powder, rhubarb pills.

On 13th August, pulse about 90, temperature last night $104\cdot2^{\circ}$, this morning $102\cdot4^{\circ}$. Tongue moist and somewhat coated. Spots seen. Bowels moved twice. Motion loose and yellow.

15th August (twelfth day).—Temperature last night 102° , this morning $100\cdot8^{\circ}$. Got draught, and had some sleep after it. Was raving. Had "formed" yellow motion. Pulse about 96. Tongue moist and somewhat loaded. Enteric spots.

20th August (seventeenth day).—Last night patient woke up complaining of pain in lower part of belly, which he supposed was caused by wind. Nurse Hargan gave him a gtt. x. dose of turpentine, and applied hot fomentations; but these measures did not seem to give relief. I was called. He afterwards got two chloral draughts, and mustard was applied. The mustard did not seem to give much relief, but he fell asleep after the second draught. He became worse again this morning after 7. Poultice, with laudanum, was applied, and seemed to give relief. He also got—

R. Tinct. opii m lxxx.
Syr. auranti q. s.
Aq. ad. $\frac{3}{4}$ iv.

Sig. Tablespoonful every two hours.

Patient describes the pain as if knives were being thrust through him—so severe that it would be better to be out of existence than endure it. The bowels were moved very freely while the mustard was on. He also complains of not passing water. A little pain on pressure over right iliac fossa. *Continue the poulticing with linseed and laudanum and the use of the medicine.* Pulse about 126. Tongue moist, with some lightish coloured fur.

21st August.—Slept a good deal. Woke up at intervals in alarm. Got two doses of the medicine during the night. Did not complain of pain. No motion. Pulse about 150.

Temperature last night (by nurse George, and with another thermometer than that lately used in the ward) $103\cdot2^\circ$, and this morning 103° .

Patient says he has no pain, but his stomach seems to be disordered. To have some turpentine in milk. Other treatment to be continued. Patient is raving.

Died to-night (21st August, 1878). Perforation suspected to have been the cause of death. This suspicion was converted into certainty next day. I opened the abdomen of deceased to examine bowel. Externally intense redness and lymph. Perforation was discovered in the bowel; external aspect somewhat of the figure of 8 shape.

The specimen was exhibited for me at the Glasgow Pathological and Clinical Society, by Dr. Robertson, the President.

Remarks.—It is noted on the 20th of August that “Last night patient woke up complaining of pain in lower part of belly.” If we regard this pain as the actual indication that perforation had taken place, it is interesting to observe that the evening temperature on the 19th was markedly above that

of the previous evening, and also that a fall of temperature was indicated on the morning of the 20th. It would appear that a rise in temperature had preceded, and a fall succeeded, the occurrence of perforation. This fall was followed by a rise. As to treatment, most relief seemed to be obtained from chloral draught and poultice, with laudanum.

CURRENT TOPICS.

THE work of Dr. W. W. Ireland, of the Scottish National Institution at Larbert, on *Idiocy and Imbecility*, has recently been translated into the Russian language by Dr. Tomaschewski, with a preface by Professor Mierzejewski; at the same time the Medico-Psychological Society of St. Petersburg (Société des Psychiatres) has conferred on Dr. Ireland the diploma of corresponding member of their body.

REVIEWS.

Die Tuberkulose vom Standpunkt der Infectionsslehre, von JULIUS COHNHEIM. Leipzig, 1880.

Tuberculosis regarded from the point of view of the infective theory, by JULIUS COHNHEIM.

THIS work, coming at the present moment from such a representative man as Cohnheim, must be regarded as a most important indication of the direction which medical science is at present taking on the much discussed question of the nature of tuberculosis.

Our author begins with a brief historical review of the question of tuberculosis. He recognises the service done by Virchow in bringing sharply out the distinction between simple caseous metamorphosis and tuberculosis. The former occurs in simple inflammatory exudations and in tumours as well as in tubercular material, and is really a necrosis of the tissue with coagulation of its albuminous constituents. Virchow endeavoured to distinguish tuberculosis by its histological characters, describing tubercles as minute nodules composed mainly of lymphoid corpuscles. But this definition, even

when modified by the observation of epithelioid and giant cells in almost all tubercles, is not now to be accepted as enabling us to distinguish tubercular from non-tubercular products.

An entirely new point of view has been reached since Villemin published his observations on the inoculation of tubercle. His statement, "If tubercular material be introduced into the body of an animal, a true tuberculosis will be acquired by it," has been abundantly confirmed by subsequent observers. It has been matter of dispute whether non-tubercular material introduced into an animal may produce tuberculosis. Some experiments, in which Cohnheim himself took part at Berlin, seemed to answer this question in the affirmative, but a repetition of the experiments elsewhere led him to the belief that there had been at that time an epidemic of tuberculosis among the guinea pigs at Berlin, and he is now of the opinion, which is otherwise generally received, that tuberculosis depends on a distinct virus, and is only produced by infection from pre-existing tuberculosis. In this paper he distinctly formulates the belief that the inoculability of different morbid products is to be taken as the test of their tubercular nature. "Everything is to be regarded as tuberculosis which produces true tuberculosis when conveyed to animals suited to the experiment, and nothing which cannot be so conveyed." If this sentence can be accepted implicitly, then a very important step in advance has been taken, and an important means obtained whereby a most vexed question may be within reach of settlement. Our author has the courage to attack this question at its most difficult point. The present writer entirely sympathises with him when he says, "Only he can fully appreciate how much is gained by this who has taken pains earnestly to study the anatomical relations of chronic tuberculosis of the lungs in the bodies of ordinary cases of phthisis." It is almost impossible to disentangle ordinary products of inflammation from tubercles, and we ourselves have to confess to having reached a somewhat doubtful state of mind in regard to this disease.

To this vexed question, our author asserts that inoculation experiments have already given the answer, and it is, that all the recognised tubercular and scrofulous processes, however different in their anatomical conditions, are tubercular, inasmuch as the products of all of them are equally active on inoculation. A piece of scrofulous tubercle of the brain, of tubercle of the diaphragm, of caseous lung, of scrofulous lymphatic gland, or any other scrofulous or tubercular material, when inoculated

into a suitable animal produces true tuberculosis. The results of inoculation are most easily followed when the material is introduced into the anterior chamber of the eye. The material should be obtained as fresh and undecomposed as possible, the fresher it is, the more certain is success, and there is the less chance of serious preliminary inflammation. After the introduction of the material into the anterior chamber in a rabbit or guinea pig, there is a preliminary irritation which soon passes off if the material has been perfectly fresh. After this the material diminishes in size gradually, sometimes till it disappears completely, and then the eye remains for a time clear and intact. Then suddenly there appears in the iris a larger or smaller number of fine grey nodules, which, just as in man, attain a certain size, and then become caseous. In rabbits the eruption generally follows 21 days after inoculation, in the guinea pig a week sooner, but it may be 14 days even in the rabbit. From the eye the tubercular infection extends variously to other organs, or it may remain confined to the eye.

If now we bring together the two statements that tuberculosis is an infective disease, and that all scrofulous processes are tubercular, it will be seen that a most serious revolution is inaugurated in our pathology and clinical medicine. All these processes are infective and are produced uniformly by infection. That tubercular processes, when once started within the body, are in the highest degree infective, that, in fact, this is their most prominent characteristic, most pathologists will readily acknowledge. But what will our clinical observers and pathologists say to the assertion that tuberculosis and scrofula arise purely and uniformly by infection? Our author does not hesitate to face the results of this position. Tubercular and scrofulous processes arise where the tubercular virus is present and lodges for a time. The locality of the process is determined by the gate of entrance, and having once obtained a lodgment, its extension is by the regular roads of the body. "The importance of the gate of entrance for the localisation of tuberculosis is most strikingly illustrated by the inoculation experiments. When tubercular material is introduced into the peritoneal cavity, there follows constantly, first, tuberculosis of the diaphragm, liver, spleen; after inoculation into the anterior chamber, the iris is first affected; after feeding with tubercular matter, the intestine and mesenteric glands; after inhalation of finely divided sputa, the lungs and bronchial glands; and after subcutaneous inoculation, the lymphatic glands next the seat of inoculation first become caseous. In the human body we are not indeed in a position to follow the

virus itself from place to place; yet the frequent, almost constant, repetition of certain conditions permits here also of certain conclusions, which I think are well grounded."

Our author now considers the various localities of primary scrofulous and tubercular processes, and endeavours to discover the probable paths of infection, and in this part there is much that is suggestive, if there is also much that is speculative. It is easy to understand how the virus should first attack the lungs, the larynx, the intestines. It does not attack the stomach, because the acid gastric juice neutralises it. It attacks mostly those portions of the intestine where the faeces linger longest—namely, the neighbourhood of the ileo-cecal valve, including the lowest part of the ileum the cæcum and the ascending colon. Apart from secondary tuberculosis of the intestine so frequently resulting from tuberculosis of the lungs, there may be a primary tuberculosis due in many cases, the author believes, to the virus being present in milk. Children seem peculiarly susceptible to this path of infection, the virus often lodging in the mesenteric glands. The kidneys are often the starting point of a tuberculosis, and the author supposes that the virus having got into the juices of the body is excreted by the kidney, and finds a lodgment there, when it develops further. The disease usually begins at the openings of the uriniferous tubules into the calices. By local infection it may spread along the urino-genital tract to long distances. More difficult is the explanation of the so frequent meningeal tuberculosis of children, and the tuberculosis of joints. For the former, our author encourages the idea of Weigert, that the virus may get inside the skull from the nares, where the canals of the cribriform plate form a ready connection. Fungous caries of the joints is now acknowledged to be mostly tubercular, and how does the virus get here? It is difficult to say, but in most cases there has been some injury preceding the onset, and it is possible that the traumatic inflammation may attract or give an opportunity to a virus circulating in the blood and not elsewhere obtaining a fitting habitus.

The author believes that the virus may be present in small quantities in the blood, but in order to produce tuberculosis it must be deposited in some quantity in particular localities. In acute miliary tuberculosis, on the other hand, there must be large quantities in the blood, and there is deposition of the virus in many organs. In order to this we must suppose that there are large quantities of the virus passed into the circulation within a short interval, and the question arises as to the

source of the virus. The author puts aside the view of Buhl, that there is always old caseous material to be found somewhere in the bodies of persons who die of acute miliary tuberculosis, on the ground that caseous material is not sufficient—we must have the specific virus. In some cases of the disease, tuberculosis of the thoracic duct has been found, and in some a tuberculosis of the blood-vessels of the lung, and especially of the pulmonary vein. Besides these, search should be made into other possible sources of infection.

Under this view of the infective nature of tuberculosis, and its production by the introduction of an active virus, the analogy with syphilis can hardly fail to suggest itself. Even in their anatomical results there is a strong analogy, so great that Virchow, in his book on *Tumours*, places both under the same class of granulation tumours. Like syphilis, tuberculosis may be transmitted from parents to children; but whereas in syphilis the manifestations generally appear either before or soon after birth, in tuberculosis there are generally many years of latency. The presence of the virus in the body may affect the constitution without producing any local outbreak, and so the author believes that, in the so-called phthisical habit or tubercular constitution, the virus is already present in the body, not necessarily inherited, but acquired in some way. Thus, a predisposition to tubercular disease generally means the actual existence of the tubercular virus, although it is not to be denied that some persons are much more vulnerable to the virus than others. It is difficult to understand how, in different persons, tuberculosis advances to such different extents, except on the principle that the tissues of some are much more capable of neutralising the virus than those of others. There is indeed no doubt that the tubercular infection may be overcome, and that persons may recover, as in the case of scrofulous glands, &c.

We have endeavoured to place before our readers some conception of the general drift of these views, whose importance it would be difficult to overestimate. For ourselves, they fall in with much that has been brought out in our own experience, and they commend themselves as solving many a difficult problem. This of itself may, however, be regarded as a reason for accepting them with caution, as it may be said to form a kind of bribe for their acceptance. It may be added that the work, although occupying only 44 pages, is full of thought, and is written in the flowing style which Virchow has introduced into German medical literature, and which Cohnheim has judiciously adopted.

J. C.

Physiological Therapeutics: a New Theory. By THOMAS W. POOLE, M.D., M.C.P.S.Ont. Toronto: The Toronto News Company. 1879.

THIS work is written with the view of promoting "a new theory of the inter-relations of nerve force and muscular tissue throughout the body." The principles which the author sets himself to prove are these:—(1.) That the muscles and muscular tissues generally of the body are endowed with an inherent contractile power of their own, independent of nervous influence. (2.) That the influence exerted by the nervous system, in its relations with muscular tissue, is that of a *restraining*, and not that of a compelling power. (3.) Electricity is not a stimulus to muscle or nerve; on the contrary, its action is that of a sedative, anaesthetic, and paralyser of nerve tissue. (4.) Contractions induced in unstriped muscular fibre, such as those of the muscular coat of the arteries, or those set up in the uterus by ergot of rye, depend in the same way on the withdrawal of nerve force, and this he illustrates by referring to the action of a number of drugs on the vaso-motor nervous system.

It will thus be seen that Dr. Poole's work is sufficiently wide in scope; but his success as the exponent of a new departure is scarcely commensurate with the ambition he displays in the effort. We have never before seen so much theory condensed into such small compass. As might be expected, "facts" in abundance are found to countenance these views: when a writer sets out with a theory to buttress and justify, he rarely fails to find what he seeks. We fancy, however, that most of the authorities quoted would be startled to see the use to which their observations have here been put. The author appears to us to have begun at the wrong end. Instead of laying a foundation of patient personal investigation, of which, indeed, there is scarcely a trace in the work, he picks one statement from one author, and another from a second, till he has laid quite a host of great names under contribution, and in this way he succeeds in propping up his theories to his own evident satisfaction, furnishing thus an example of how not to accomplish any sound or valuable therapeutical work. We confess that our first inclination was to fulfil the melancholy and almost prophetic expectation expressed at the close of the work, that "some will treat our pages with silent contempt," or "regard them as unworthy of serious attention;" but as the author seems thoroughly convinced of the importance of his

doctrines, and urges them with no little enthusiasm, we are content, while giving him full credit for honesty of purpose, to observe merely that, in our opinion, he has utterly failed to make good his position; and that, further, the work is not one from a perusal of which the student or practitioner is likely to obtain the slightest benefit.

REPORTS OF HOSPITAL AND PRIVATE PRACTICE.

WESTERN INFIRMARY.

REPORTS UNDER THE SUPERVISION OF DR. W. G. DUN.

FROM DR. PATTERSON'S WARDS.

FRACTURE OF SPINE, PARAPLEGIA—PARTIAL RECOVERY.—Philip McCabe, æt. 53, was admitted 10th July, when the following was noted:—

The patient, who is a watchman, whilst going his rounds last night about 12 o'clock, fell from a platform on which he was standing, about a distance of 40 feet, striking a plank on the way, which he thinks had the effect of breaking his fall. He was stunned for a short time, and on regaining consciousness, found that he could not alter his position, and on attempting to do so, experienced great pain in the small of his back. He lay on his back for about 8 hours, not being able to obtain assistance, and was then conveyed to the Infirmary. He complained of great pain in his back, which was aggravated by the slightest movement. On examination, it was found that the right leg was completely paralysed as regards motor power, but he was able to flex the toes and ankle of the left limb to some extent. Palpation over the lower lumbar region caused great pain. It was found that he had not micturated since the accident, and on admission his bladder was distended. In addition to the injury to the spine, there was a compound Colles' fracture of the right forearm. The flesh wound was very small. It was reduced, and put up antiseptically. The patient was immediately put on a water bed, and his urine drawn off by a catheter every four hours.

12th July.—Patient much in the same state, but free from pain. Has not had a motion from his bowels since admission.

14th July.—Last night patient passed a large amount of faeces involuntarily. Bladder still paralysed.

21st July.—Had another alvine discharge last night, which was involuntary. Complains of pain in his right leg.

1st August.—No appearance of improvement, and the patient is losing flesh.

5th August.—Patient last night suddenly regained the power of micturating, but still some urine dribbles away involuntarily. Also has regained power over the rectum. The fracture has never been disturbed, as no symptoms calling for dressing have presented themselves.

18th August.—Has been complaining of tenderness in the back for some days past, and methylated spirits has been applied, but in spite of precautions, a small bed sore has broken out on his back.

21st August.—Patient can move the toes of the right leg very slightly. Can also move the left leg to a greater extent than on admission.

28th August.—The bed sore, which has been dressed regularly, appears to be diminishing in size.

8th September.—Patient progressing favourably.

18th September.—Can flex the toes of right leg; also the right knee and ankle to some extent. The left leg seems to have quite regained its power. The patient is picking up flesh rapidly. Strychnine and iron are being administered.

ADENOID TUMOUR OF TONGUE—REMOVAL—RECOVERY.—A man aged 31 years was admitted suffering from a simple tumour of the left half of the tongue. This tumour had been growing for 12 years, and had reached the size of a walnut. In order to remove it, Dr. Knox, who is now in charge of Dr. Patterson's Wards, passed a double wire suture through the tongue to the inner side of the tumour, in order to constrict the tumour from the substance of the tongue and restrain haemorrhage. An incision was then made along the side of the tongue, and the tumour readily enucleated. There was but slight bleeding, and the edges of the wound were brought together by silk stitches. Four days after the operation the wound was quite healed, and the patient dismissed.

The tumour was examined by Dr. Joseph Coats, who reports—The tumour, which is about the size of a small walnut, is smooth on the surface and completely surrounded by a capsule. Its cut surface is grey, with occasional haemorrhage. Under the microscope the tissue is found to be mainly glandular, large numbers of acini like those of mucous glands being supported by a fibrous matrix.

FROM DR. GAIRDNER'S WARDS.

(Temporarily under the Care of Dr. SAMSON GEMMELL).

ENTERIC FEVER—HIGH FEVER OF A REMITTENT IRREGULAR TYPE, ASSOCIATED WITH MUCH PROSTRATION, RIGORS, AND RAPID EMACIATION—A FEW SUSPICIOUS LOOKING “ENTERIC SPOTS,” WITH VAGUE ABDOMINAL SYMPTOMS, AND A QUESTIONABLE STATE OF THE APEX OF RIGHT LUNG—PROGRESSIVE ASTHENIA—SUPERVENTION OF PULMONARY SYMPTOMS.—DEATH—POST-MORTEM.—Robert H., æt. 20, admitted 13th Aug., 1880, complaining of somewhat indefinite symptoms of failing health of about six weeks' duration. The chief of these symptoms were loss of weight and vomiting, the latter having apparently distinct relation to the taking of food. He had been confined to bed for about 14 days while at the worst, but had resumed work a fortnight prior to admission to hospital, which he sought on account of extreme weakness. The note made at this date bore record of considerable emaciation associated with a non-febrile temperature, an impaired appetite, a somewhat foul tongue, but regular bowels, and urine normal in all respects. There was no history of cough, no sweating, and the only physical condition that might indicate a departure from the normal was very slight relative flatness of the percussion tone over the right apex, in part with faint tubularity of the respiratory murmur, but no râle of any kind. The family history, however, was decidedly phthisical.

He was put upon a tonic mixture, and his condition carefully observed, and for the first 8 days he seemed improving slightly, the temperatures remaining normal. He began, however, to make complaint of sore throat, and the temperature rose to $101^{\circ}6$, and the day after, had reached $104^{\circ}6$. The throat affection was the only local manifestation, and consisted of a diffuse redness over the fauces, soft palate, and back of the pharynx. Very careful examination of the skin detected no rash. The temperatures continued high till the 24th, and on the afternoon of this day, it having reached $104^{\circ}4$, a dose of quinine (30 grs.) was administered with the apparent effect of producing a fall to $100^{\circ}2$. It soon rose again, however, and continued oscillating between 104° and 101° , the evening temperatures usually predominating, with a pulse ranging from 90 to 110. On the night of 27th August, he had three very loose motions of no very special character, unattended by any abdominal pain, except that once or twice, when firm pressure was made in the iliac regions, he said it felt a little sore; there was no distension of the abdomen, but some

gurgling in the right iliac fossa. The body was examined carefully every day for eruption, and on the 27th, 3 or 4 spots having a vague resemblance to the enteric eruption were discovered on the abdomen, which next day were reinforced by a few more of similar character. Patient was rather apathetic, but quite intelligent when questioned, and the pupils were moderately dilated. The bowels continued loose for a few days, the stools of no special character, but after 3rd September, and till the last day of the illness, they were chiefly moved by injection. The abdomen remained undistended, no more eruption was developed, and the spots already present persisted for about a week, and faded in a rather irregular fashion. Slight cough and expectoration also developed, but there was no change in the physical signs in the chest. The temperatures, however, continued high, with occasional falls to about 101°, emaciation progressed rapidly, with much perspiration, some degree of nervous tremor, and a dry and fissured tongue, without any cerebral symptoms. On 31st August the temperature was noted 105°, but during the course of the day it fell to 102.2°. At 7 in the evening of this date he had a most violent rigor, with a temperature of 105.6° and a pulse of 168, from which he emerged with a profuse perspiration. The 6 oz. of wine which he had daily for some time prior to this were supplemented by 6 oz. of brandy, and the milk diet, with occasional soup and beef tea, was continued. Ice cloths to the stomach were also ordered, and were repeated whenever the temperature exceeded 103°.

The further history of the case was that of very rapid emaciation with high fever, occasional rigors, profuse sweatings, and a very variable pulse, but with no pronounced local condition, either pulmonary or abdominal, till 10th September, when he complained of intense pain in the left side of the chest, which, on examination, was found to be associated with abundant coarse râle, which at first had a distinctly grating character, but soon developed a highly liquid quality with much tubularity. There was not, however, any development in the pulmonary apices. In spite of most careful treatment and nursing, the asthenia gradually increased, the temperature fluctuating between 100° and 104.6°, the pulse ranging from 120 to 140, feeble and dicrotic, and he died at 10 P.M., on the 14th, sensible to within 20 minutes of his death, but very apathetic, pallid, and emaciated to the last degree.

The *post-mortem*, made on the morning of the 16th, revealed pleurisy, with much fibrinous exudation in the lower left

lateral region, and hypostatic congestion of the left lung. There was also a small collapsed portion of lung with some old adhesions in the right apex, but no tubercular deposit anywhere. The spleen was very soft, and quite disorganised. There was extensive ulceration towards the coecal end of the ileum, and higher up, many of the Peyer's patches were wholly or partially ulcerated, some of them occupied by yellow slough. One or two of the ulcers were very deep. There were some embolic infarctions in the kidney, one or two of them in a process of fatty transformation. No trace of peritonitis was present, but the mesenteric glands were enlarged.

Note.—The chief difficulty in this case was one of diagnosis. The problem from the first onset of the acute symptoms was, Is this a case of enteric fever or general tuberculosis? and the most careful scrutiny was daily made of the symptoms and general condition of the patient, in order, if possible, to resolve the doubt. The vague abdominal symptoms and the suspicious looking spots inclined the diagnosis in the direction of enteric fever, all the more so as there were no very manifest pulmonary signs or symptoms; but the lad was of a very phthisical family, was himself reputed phthisical by his friends, and had been in failing health for many weeks. Moreover, the physical examination of his chest revealed a rather unsatisfactory condition of the apex of his right lung. The occurrence of somewhat acute pulmonary symptoms towards the close of the case tended further to perplex the diagnosis. The *post-mortem* showed the original impression to be correct, but certainly the case was not of an ordinary type. A question might be raised as to whether the symptoms exhibited by the patient while in hospital were not simply due to a relapse of an enteric attack which he had had prior to admission, but there was nothing in the previous history pointing conclusively to this, and certainly the *post-mortem* condition gave no ground for such a surmise.

Every attempt was made to keep up the patient's strength by milk (of which he took a large quantity), beef tea, &c., and stimulants were freely exhibited, their administration, however, being carefully regulated by the symptoms. The temperature was also kept well in check by the application of iced cloths to the stomach. The prognosis, from an early period, was considered very grave, and it was only too fully realised by the uninterrupted downward course of the case.

FROM DR. FINLAYSON'S WARDS.

SOFT SARCOMA OF FOREARM—SECONDARY TUMOURS IN LUNGS.
 [Reported by Mr. Eric Sinclair.]—Michael M'Donald, labourer, æt. 30, was admitted 11th March, 1880, with a large tumour of the right forearm. Patient first noticed the swelling in the arm four months ago, and it has since steadily increased in size. It now occupies the whole front of the forearm, and extends from the elbow more than half way to the wrist. It is firm and elastic to the touch, and with the arm forms a spindle shaped mass measuring $13\frac{1}{2}$ inches in its greatest circumference. At the middle of the right humerus an enlarged gland is detected.

Two months ago, patient states that he caught cold, and he has since then suffered from cough and spit. The expectoration has nearly always been streaked with blood, and at times he has brought up as much as a mouthful of it at once. In a short time after this, he began to suffer from dyspncea, and within the last week or two has been so breathless as to need to sit up in bed at night.

An examination of the chest shows that the right side is restricted in its movements, and that it is dull to percussion all over. The respiratory murmur also is very feeble on this side, or indeed almost absent. There is some bulging of the intercostal spaces at the lower part, and the vocal resonance is somewhat increased. On the left side there are a few dry bronchitic râles. The right side is found to be $\frac{1}{4}$ inch more than the left in circumference. Cardiac dulness extends fully an inch to the left of the nipple line, but the sounds are pure. The decubitus is chiefly dorsal, but occasionally on the right side.

19th March.—This morning marked pericardial friction was heard for the first time, although no pain had been complained of on the left side. The friction was supposed to be in part pleuritic, but it can be heard when patient holds his breath, and no pronounced pleuritic friction is heard on his taking a deep breath; the sound is at times of such a character as to resemble the jumbling of fluid and air, but with regard to this nothing certain can be made out. The dyspncea is somewhat improved since admission by the rest in bed. Yesterday, patient brought up some red-coloured blood. The right side of the chest is still nearly an inch larger than the left.

22nd March.—Pericardial friction still continues, but is heard only at the apex region of the heart, and there is evidently no great effusion. The condition of the lungs is

still the same—dulness and feeble respiration on the right side, and bronchitic râle on the left. There is now no great difference in the measurements of the two sides of the chest. Occasionally small quantities of pure red blood are brought up, but more often there is an intimate admixture of blood in the frothy expectoration; hæmoptysis still continues, the patient is very weak and ill.

24th March.—Patient died at 5.30 P.M. this afternoon.

Post-mortem examination by Dr. Joseph Coats. The right forearm is the seat of a large soft tumour, which extends from the elbow about two-thirds down the arm. Just above the elbow, and on the internal aspect, there is a tumour about the size of a walnut, but there is no other enlargement of the lymphatic glands of arm or axilla. The right lung is the seat of innumerable soft grey tumours, which almost completely occupy the lung tissue, but are most abundant towards the surface. In the left lung there are also numerous tumours, but they are of smaller size, and leave a considerable amount of lung tissue. These also are more abundant towards the surface, but even those at the surface originate in the lung, none in the pleura. These tumours, as well as that in the arm, consist essentially of small spindle-shaped cells with large oval nuclei. There was a general enlargement of the mesenteric glands, but they were found to consist of lymphatic tissue, not sarcomatous.

FROM DR. M'CALL ANDERSON'S WARDS.

(*Temporarily under the Care of Dr. JOSEPH COATS.*)

JAUNDICE AND DISTENSION OF GALL BLADDER, PROBABLY FROM CATARRH OF DUCTS—RECOVERY. [Reported by David Inglis, M.B.]—Mrs. Gallacher, aged 21, admitted to the Western Infirmary on 10th September, 1880. On admission, patient stated that, for a period of nine months or thereby, she had suffered from more or less pain over the liver, with frequently recurring attacks of nausea and vomiting; and that, about twelve days previous to her admission, she observed that her skin had acquired an abnormally yellow tinge.

She connects the appearance of the pain mentioned above with a strain which she received while lifting a heavy weight. The immediate consequences of this were faintness, sickness, and vomiting of clotted blood, which, however, does not appear to have been very great in quantity, and entirely disappeared in three days. The pain has continued, in a greater or less degree ever since, over the upper part of the

abdomen, and is much aggravated when any pressure is made over that region, though when patient is at rest in bed it amounts to only a feeling of uneasiness. At intervals the sickness and vomiting, at first complained of, recur, and are preceded by a feeling of uneasiness and weight in the stomach after meals. About twelve days before admission, the pain became very much aggravated, so much so that she was forced to keep her bed; and soon after she noticed the discolouration of the skin, and also of the urine, which she describes as having been at that time as dark as porter.

An examination of the abdomen revealed nothing abnormal in the appearance of the parietes over the liver; but, on palpation, tenderness was elicited over the whole organ, with greatest intensity at a spot situated about 2 inches above the umbilicus, and 1½ to the right of the middle line. In this situation, nothing which could indicate the presence of tumour could be detected. On percussion, the upper margin of hepatic dulness was found to be lower than normal, being almost 3 inches below the nipple. The lower margin was also depressed, and the area of dulness was increased, measuring in the nipple line fully 4½ inches, and in the middle line almost 4½ inches. Projecting from the lower edge of the hepatic dulness a tongue-shaped dull area was clearly made out, measuring about 2½ inches in both its diameters, and passing obliquely downwards and inwards from the nipple line nearly to the middle line at the umbilicus. It was nearly in the centre of this dull area that the greatest amount of tenderness on pressure was experienced.

The urine, on admission, was of normal quantity and specific gravity, but was loaded with bile-pigment. No albumen or tube casts could be detected.

Treatment was commenced on the 12th of September, when an enema was ordered to relieve the bowels, which, for some days, had been very constipated. The motions which followed this were very hard in consistence and of a characteristic pipe-clay colour. One of the earlier motions had the appearance of a thick solid cylinder of pipe clay. On the 14th, she was ordered to have a teaspoonful of Carlsbad salts, dissolved in a glass of hot water, every morning before breakfast. After this the bowels were regularly moved once daily, with considerable relief to the nausea and vomiting.

On the 17th it was noted that her complexion had nearly regained its natural appearance; the stools contained bile for the first time the day before; and the urine, though still dark, was markedly less so than before treatment was commenced.

On the day preceding the note, she was, for the first time since her illness began, entirely free from sickness.

On examination of the liver, the lower edge was found to be quite regular, and the downward projection, before referred to, had quite disappeared. The lower edge was found somewhat lower than normal, but the upper edge is also lower, being 3 inches below the nipple. In the nipple line the transverse measurement is $3\frac{1}{4}$ inches as against $4\frac{1}{2}$ on admission.

Remarks.—The previous history in this case indicates a catarrh of the stomach, and the view taken of the jaundice was that it resulted from catarrh of the bile ducts following on that of the stomach and duodenum. The tongue-shaped area of dull percussion projecting from the liver was ascribed to distention of the gall bladder. It should be noted that the exact delimitation of this area was only accomplished after the bowels had been thoroughly moved, as the accumulations of faeces in the transverse colon precluded accurate percussion of the lower edge. The rapid disappearance of the jaundice and of the distension of the gall bladder under a treatment directed to the catarrh of the stomach and upper bowel, seems to confirm the view taken of the nature of the case.

CASE OF ATHETOSIS IN A CHILD, WITH UNDUE SMALLNESS OF HAND AND ARM—NO PREVIOUS PARALYSIS.—John Maitland, aged 6, was admitted 10th September, with peculiar movements of the right hand and foot. The case is interesting, as it diverges from most of the cases of athetosis described, in respect of the age of the patient and the absence of any history of preceding paralysis. While awake, there is a continuous slow movement or spasm of the hand and fingers, all the muscles being apparently engaged, but without any regularity. The fingers are sometimes flexed, sometimes extended, sometimes with one or more flexed and others extended, and so forth. A frequent position of the hand is with the ball of the thumb brought into the centre of the palm, the index finger extended and moving about, and the other three fingers flexed over the ball of the thumb. He has an exceedingly limited command of the muscles. On being asked to lift an object, he does so with great difficulty; the thumb is brought across the palm, and the object is caught, after much effort, between the spasmodically flexed fingers and the closed thumb and palm. He has also difficulty in letting go an object, being quite unable to lay it down in a fixed position. There are also movements of the wrist of an equally irregular character. The spasm in the foot is much more limited, and consists

mainly in an extension of the great toe, which points spasmodically upward while the remaining toes are irregularly flexed.

Careful measurement shows distinct reduction in the circumference of the arm, forearm, and palm of hand, with slight shortening of the palm. The lower leg is also thinner, but the thigh is slightly thicker, this being the only part of the limbs in which the usual slight preponderance of the right exists.

The mother of the boy, who is a very intelligent woman, states quite distinctly that there was no paralysis or convolution preceding the onset of this disease. It began when he was two years of age, and she associates with its commencement a slight burn by a spark from the fire, on the index finger. This soon healed, but about the same time she noticed that he held out the index finger in a peculiar fashion, and by and bye movements of the whole hand began; the disease had reached its present amount in the hand in a few weeks. The foot began to be affected some months afterwards, and the prominence of the great toe has always been the most marked appearance in it.

GLASGOW ROYAL INFIRMARY.

REPORTS UNDER THE SUPERVISION OF DR. WILLIAM MUIR.

FROM DR. CAMERON'S WARDS.

MYELOID SARCOMA OF LOWER END OF ULNA—REMOVAL—RECOVERY. [Reported by J. Huntly Peek, L.R.C.P.E., &c., House Surgeon.]—C. M., a girl aged 21, sought advice at the Royal Infirmary Dispensary on 3rd August, for a swelling situated on inner and lower portion of left forearm. Patient stated that swelling began about New Year and gradually increased. It gave her very little pain, and did not interfere with her duties as a bookfolder. She was advised to come into hospital, which she did on 7th August. Dr. Cameron, after examining the tumour, made an exploratory puncture, but detected nothing definite. Dr. Cameron having left for his holidays, Mr. Clarke took charge of the wards. He called a consultation on the case. One surgeon was of opinion that the wrist was diseased, and that it was a fine case for excision; another said that it was a strumous deposit,

and advised a free incision into the swelling and scraping out the contents with Volkmann's spoon. Mr. Clarke, agreeing with the rest that it was a tumour, proceeded to operate on the 18th August. The patient was taken into the theatre, and, after being put under chloroform, an incision about 3 inches long was made from the styloid process of the ulna upwards, exposing the whole length of the tumour. After a little careful dissection, the tumour was found lying between the flexor and extensor tendons which pass forward to the hand; these were held out of the way by retractors. It was now found that the tumour had no connection with the radius, but that it involved the interosseous membrane. The ulnar artery and nerve were exposed for some length, and very great care was taken to avoid wounding them. After freeing the tumour as much as possible from its attachments, the ulna was divided a little above the seat of the tumour; the cut end was then drawn down, and the tumour gradually dissected out with the lower portion of the ulna, the articular cavity of the wrist being opened into. In the course of dissection, the posterior interosseous nerve was cut, as it lay in very close contact with the tumour. The edges of the wound were brought together by means of thick silver wire sutures, and, to relieve all tension, two pairs of Lister's button sutures were applied, a substantial drainage tube was inserted, and the usual antiseptic dressings were put on. The forearm and hand were then placed on a splint. The wound healed nicely, five dressings only being required. Temperature remained normal. The drainage tube and most of the sutures were taken away at the third dressing, and it was almost healed on the 29th, when the fifth dressing was applied. Patient left well on 10th September. Her hand was placed on a splint which extended to the metacarpo-phalangeal articulation to allow of free motion for the fingers. On leaving the hospital, the movement of the fingers was free, but that of the wrist joint rather impeded. Dr. Foulis examined the tumour, and pronounced it to be a myeloid sarcoma. The case was rendered interesting, first, from the extremely fluctuant character of the tumour; and, second, from the diversity of opinion expressed by the surgeons at the consultation.

MEETINGS OF SOCIETIES.**GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.****SESSION 1879-80.****MEETING IX.—10th MAY, 1880.****DR. ALEX. ROBERTSON, President, in the Chair.**

DR. ROBERTSON showed a BRAIN WITH SANGUINEOUS APOPLEXY AND HÆMATOMA OF THE DURA MATER. It was that of a boy, aged 10, and contained two sanguineous effusions, one in the substance of the right occipital lobe, and the other in the back part of the right parietal lobe, each being about the size of a walnut. There was also a false membrane lining the greater part of the dura mater, on the right side, and extending to the base. This was red in colour, and could be peeled off the dura mater with ease, leaving the latter smooth and bright, as usual in the young. It was considered to show well the process of formation of false membrane by the organisation of effused blood.

The left ventricle of the heart was hypertrophied, and the mitral valve was loaded with vegetations.

The boy had been paralytic on the left side for nine months, and died after convulsions affecting chiefly the right extremities. Mind had been almost entirely in abeyance during the last two months of life.

DR. M'PHAIL showed A TUMOUR OF THE HUMERUS, for which amputation had to be resorted to. The notes are as follows:—Miss L., æt. 22, tall, well developed, and healthy looking. She is said to have been slightly ricketty when a child, but the only evidence remaining is that she is somewhat pigeon-breasted. Family history good.

For some time before the disease became apparent (how long she could not state), she suffered from occasional slight pain in the left humerus, but so slight and flitting that it attracted no attention. In October, 1878, while dancing at a ball, she received a slight blow upon her left arm by coming against another dancer. Her arm became powerless and very painful, and on examination it was found that the humerus was broken. The fracture seemed well united at the end of five weeks, but was reproduced within a fortnight. At that time it was found that a second fracture had occurred

at the surgical neck, and that the portion of bone between the two fractures had become diminished in size, though it was quite firm. Two months afterwards this section of bone was found to be thicker, and perfectly soft and pliable in every direction. So long as the arm was supported by splints she did not suffer any pain or inconvenience. About August, 1879, she began to suffer severe pain, supposed to be rheumatic, in her right arm. The pain was only felt when she tried to raise her arm, and appeared to be in the muscle, probably near the insertion of the deltoid. Passive motion or striking the bent elbow did not cause pain, but galvanism, used under the idea that the pain might be rheumatic, caused such intense pain that it had to be stopped at once. About the beginning of December, 1879, a fracture was discovered in the upper third of the right humerus, but how it was produced patient could not tell. In the case of this bone there was not the slightest attempt at union, and swelling began much more rapidly than in the other.

The swelling in both arms increased rapidly, but the general health remained good.

On the 4th inst., the day of operation, it was noted that her general health had been perfect up till that date. The tumours were pyriform, tapering from above downwards, and on both sides extended from the shoulder to the elbow. They were firm, with a few softer, semi-fluctuant spots, slightly lobulated or "bossy" in outline, and the skin over them was tense, polished, pale, and the superficial veins well marked. The upper arm could be bent freely in every direction, and no trace of firm bone could be felt. There was no affection of glands, and the lungs were perfectly free upon both sides.

Amputation was performed through the left shoulder joint. The knife cut through the growth beneath the joint, but what remained was easily torn out. No trace of the head of the humerus could be found, but the glenoid facet and other portions of the scapula exposed seemed quite healthy. Few vessels had to be tied. The patient did well at first, but died after amputation of the other arm.

Dr. Joseph Coats referred to the probable origin of the tumour, as shown by the present appearances and the history of the case. At present, the tumour, presenting a large pyriform mass, entirely replaces the humerus, all that is left being the condyles. There are spiculae of bone here and there in the tumour, but they are very few. Looking to these circumstances it is clear that the tumour has originated in the medulla of the bone. It has grown outwards, by and bye

destroying the dense bone of the shaft, and allowing of the fracture. It has then grown continuously outwards, destroying the entire bone except the condyles. In connection with this there is a cyst in the midst of the tumour towards its upper part, this cyst probably originating in fatty degeneration, which is very prevalent throughout the tumour. This cyst indicates the original seat of the tumour.

DR. ROBERTSON showed a PATIENT ILLUSTRATING THE DOCTRINE OF CEREBRAL LOCALISATION.—J. H., aged 28, moulder, married, admitted 30th April, 1880. Nearly four years ago, while standing against a wall, patient was tripped by a fellow-workman, and fell back, his head striking the pavement with considerable force. Though stunned at the time he was able to resume work in a few hours, but felt giddy, and the giddiness has continued with varying intensity since that time. There was but little headache at first, but, after some months, it increased in severity, and is still often very troublesome. The pain is described as being of a sharp, shooting nature, passing through the temples; sometimes felt at the top of the head and in the back of the neck. About two years ago he became subject to convulsive seizures. These have usually begun in left hand, thence extended to elbow, where they sometimes stopped, and then gradually passed away, particularly if the arm were well rubbed. While they lasted, the hand shut and opened spasmodically for about two minutes. At other times the convulsive action passed upwards, involving the upper arm and side of the neck and head. In the more severe attacks he often became unconscious, but not usually till after the convulsions had affected the arm for a minute or two. A feeling of severe palpitation at the heart was often a feature of the major attacks before unconsciousness set in. The seizures have been irregular in their recurrence, the intervals varying from a week to a month in duration; latterly they have been more frequent.

With respect to his general habits, he states that he has been strictly sober since the injury, but previously, though not a drunkard, he had taken whisky somewhat freely. He declares that he has never had any form of venereal disease, and there are no indications of syphilis observable.

In the course of my examination of him, which occupied about three quarters of an hour, on three occasions he suddenly became abstracted, his eyeballs oscillated from side to side, and he looked slightly upwards, while a smile passed over his face. On asking an explanation, he declared that he saw women, old acquaintances, before him. How they came there

he had no idea, but to him, he added, they appeared perfectly real, though, at the same time, he knew that they must be imaginary. They always seemed to come in from the left side. These visions did not remain more than a minute, but, he informed me, they would stay much longer if he allowed his mind to dwell on them.

The pupils are unequal, the left being smaller than normal. There is no distinct disease in the fundus of the eyes, though the retinae at some points are a little hazy. When giddy, does not see well, particularly with left eye. He can distinguish colours fairly well. He can hear when addressed, if the voice is moderately loud, but he cannot hear the tick of the watch, unless it be pressed firmly against the ears, and he cannot hear it at all if placed over the cranial bones. The other special senses are correct, and there is no lesion of motor power, nor defect in general sensation. However, when giddy, his gait is unsteady. The mental faculties are somewhat enfeebled ; he is facile and rather childish. The hallucinations of vision are often so vivid that reason can scarcely correct the false impressions, and, for the time being, he is all but insane.

On percussion of the skull, in the way I formerly described, he stated that tapping is decidedly most painful on the right side, in a somewhat indefinite area, from 2 to 3 inches in diameter, above the level of the ear, and, for the most part, in front of it. Upwards, it extends to about an inch from the middle line of the skull. He points to the upper part of this region, a little in front of the ear, as the portion where percussion causes greatest pain.

Before admission he had been subjected to cupping, leeching, blistering, and an issue in the neck, besides internal treatment.

On the fourth night after admission, patient had eleven convulsive attacks. Unfortunately I was not called to see him. An intelligent man who attended him states that the spasms, in all but the last, were confined to the head, mouth, and eyes, and did not affect the arms and legs. Much saliva ran out of his mouth while he was in them. Each one lasted about five minutes. The exceptional one was more severe than the others ; the whole body was convulsed in it, and the attack was followed by mania that continued for about ten minutes.

First. This case supports the doctrine of the localisation of motor centres. Without seeking to draw deductions respecting the position of particular centres, which the symptoms do not warrant, I remark that the convulsive movements, affecting chiefly the left arm and the same side of the head, point to the anterior part of the motor region of the opposite side of

the brain; and the area of special pain corresponds with that indication, being in the fore part of that region and in front of it. The hallucinations of vision, and the degree and form of deafness, show that other parts of the brain besides the motor region are involved.

Second. The short duration and paroxysmal character of the visual hallucinations, and their association with nystagmus, are interesting and exceptional features in the case. Such hallucinations may justly be regarded as convulsions in the sphere of special sense.

Third. The case illustrates, to some extent, the value of percussion of the skull as a means of diagnosis. Thus, I did not understand from the patient's statement that the pain in the head was at all one sided till I had percussed it. However, after this fact had been elicited by percussion, he stated that he had previously occasionally felt somewhat severe pain in the area above defined.

DR. FOULIS showed A SERIES OF SEVEN SPECIMENS OF SCIRRUS OF THE FEMALE BREAST, specially prepared to show the relation of the cancer mass to the nipple. In some of these the nipple was involved, but in such a manner that there was a line of demarcation by fatty subcutaneous tissue between the cancer of the nipple and the main mass of the cancer, the communication being along the ducts. In others of the cases the cancer seemed to drag in the nipple merely by dragging mechanically upon the ducts, and the cancer mass seemed to be quite apart from the nipple. In a third variety the cancer had infiltrated the nipple ducts and the septa of the gland far and wide, and in this variety there were several masses of cancer here and there in the breast only united by the infiltrated septa. He placed the specimens on the table to compare with Dr. Forrest's case, in which, although the nipple was the seat of a precursory eczema, yet the main nodule of the cancer was far away from it in the axilla.

DR. CAMERON showed TWO EXAMPLES OF CYSTIC DISEASE OF THE MAMMA. The first mamma shown was removed about three years ago, and the patient still keeps well. She first came to hospital with a small cyst near the nipple, which, on being tapped, was found to contain a quantity of blood. As it refilled rapidly, and evidently contained an intra-cystic growth (which could be felt when it was emptied), the cyst was excised. The growth was a vascular, cauliflower-like excrescence, and was evidently the source of the blood which the cyst contained. She returned in about six months with numerous cysts in the mamma, and the whole gland was

removed. The second example of the disease also showed the existence of very numerous cysts varying in size from that of a split pea to that of a small orange. This cystic disease implicated every part of the gland, and the whole breast was removed. The patient remains well. Both were unmarried women.

M E D I C A L I T E M S.

UNDER THE DIRECTION OF

ALEX. NAPIER, M.D.

Chicken Cholera, and Virulent Infective Diseases generally.—Under the name "Chicken Cholera," Pasteur describes (*Compt. rend.* xc, No. 239), an infective and rapidly fatal disease, to which fowls, in certain districts, are subject, in which the prominent symptoms are asthenia, followed by coma. This disease is due to the presence and development of a micro-organism, the existence of which was first conjectured by Moritz, and subsequently demonstrated by Peroncito and Toussaint. This minute organism can be cultivated in urine, but with great difficulty, and not at all in hay-infusion—fluids in which most other germs develop freely; in a soup made of chicken flesh, however, it multiplies abundantly, appearing in the form of exceedingly delicate rods, which are somewhat constricted about the middle. Hens inoculated with fluid containing this virus succumb very rapidly; but in guinea pigs similarly treated merely a strictly local affection is set up, the formation of an abscess, while, as regards general health, the animals escape unharmed; the pus taken from the abscess contains the same micro-organism, and is as rapidly fatal to hens as the original virus. Pasteur further asserts that by modifying the method of cultivation in a certain way, which, however, he declines at present to make public, he is able greatly to diminish the virulence of the virus, this diminution being indicated by a slower rate of development of the disease on inoculation, and by the fact that the affection so produced is of a more simple and transient nature, and not fatal. And, further, it is stated that animals which have been inoculated with the attenuated virus, and have recovered, are thereby protected from the action of the original powerful virus, which now produces in them merely a slight local disturbance. The mild and severe forms of this affection are therefore held to

stand in the same relation to each other as vaccinia and small-pox. When this modified virus is inoculated into a muscle, an active development of the special micro-organism goes on, a portion of the muscle sloughs, and the cavity left is soon covered in by healthy granulations.

A communication, read on 12th July, at a meeting of the Académie de Medicine, by M. Toussaint, a veterinary professor at Toulouse, has an important bearing on this subject, which seems to open up a prospect of "vaccination" for other virulent and infective diseases besides small-pox. M. Toussaint affirmed that he had discovered a method of so modifying the anthrax virus that it could be used as a protective from carbuncular disease (splenic fever) in animals, just as vaccination is employed against small-pox. He also, following Pasteur's lead, did not divulge his method of manipulating the virus. The action of these gentlemen in thus keeping secret a procedure of such value was loudly and severely condemned by many of the most prominent members of the Academy. At next meeting, held on 3rd August, a statement was read for M. Toussaint, in which all the steps of his method of procedure were given. He at first used the blood of animals suffering from anthrax, after defibrinating it by whipping, and filtering to free it of bacteria; but as this process was slow, and not sufficient to exclude the germs thoroughly, he now simply raises the temperature of the defibrinated blood to 55° C. for ten minutes. The further results of the experiments were excellent; five sheep inoculated with 3 cc. of this blood, and afterwards inoculated with the original unmodified virus, escaped unharmed. To secure complete protection, this inoculation must be practised several times, at least twice. Animals so protected are not only proof against anthrax, but escape without even suffering any local inflammatory disturbance when subsequently inoculated with active virus; the wounds necessarily made in inoculating cicatrise like simple wounds, a fact which leads M. Toussaint to think that in his experiments the development of anthrax was prevented, not by an impermeable condition of the glands, but by the blood, lymph, and other fluids of the system being so modified that the growth of the parasite in them became impossible.—*Bull. Gén. de Théráp.* 30th August, 1880.

Agaricus Muscaria in the Treatment of the Night Sweats of Phthisis.—The amanita muscaria, or agaricus muscarius, from which muscarine is obtained, is a fungus which grows abundantly in the Highlands of Scotland. It is

largely used by the inhabitants of Siberia and Kamtschatka as an intoxicant. One of its singular effects is that it imparts to the urine an intoxicating quality; the poorer people therefore drink the urine of those who have eaten the fungi in order to induce its effects, and every one who has partaken of it has his own urine similarly affected. The alkaloid muscarine was isolated in 1869. Given hypodermically, the smallest quantity capable of producing symptoms was one-third of a grain; it contracts the pupil, excites profuse perspiration, free salivation, and running at the eyes and nose, and sometimes purging, nausea, vomiting, and a desire to urinate. While it contracts the pupil when given internally, applied locally it dilates it, in this respect resembling gelseminum. Dr. W. Murrell states that for the last six months he has used the agaricus muscarius in the treatment of the night sweats of phthisis. The preparation employed was a one per cent solution of a liquid extract of about the consistence of treacle. 26 cases were so treated, 16 men and 10 women, their ages ranging from 46 to 10. Five minims of the above solution was the smallest reliable dose; this was taken in a little water, three times a day; or it may be given in the evening, at intervals of an hour before going to bed. Improvement is usually apparent on second or third night, and by the end of the week perspiration usually ceases; it does not make the skin abnormally dry. In almost every case benefit resulted. The medicine is almost tasteless; it is apt to spoil, but the addition of a few drops of spirit makes it keep well. There is no danger in using it; a delicate young woman took 15 minims every three hours for a week, and then 20 minims every three hours for another week, without the production of any symptoms. The drug should be pure; its power of arresting the action of the frog's heart when topically applied is the best test of its activity.—*The Practitioner.* August, 1880.

Methæmoglobin.—Solutions of this substance give, according to Dr. A. Jäderholm (*Zeitschr. f. Biol.*, xvi, p. 1), a spectrum in which are seen four absorption bands—one in the red, two, less distinctly marked, in the green, occupying nearly the same situation as the bands characteristic of oxyhaemoglobin, and one, very faint and not always clearly visible, in the blue. The bands in the green Hoppe-Seyler thinks due, not to the presence of methæmoglobin as such, but to admixture of oxyhaemoglobin, grounding this view on the observation that the first band in the red is often very strong and well marked, while those in the green remain faint. Jäderholm, on the

other hand, holds that these bands in the green belong essentially to methæmoglobin, as they persist even when the whole of the oxyhæmoglobin has been converted into methæmoglobin. He further shows that, on diluting solutions of oxyhæmoglobin, the two bands characteristic of that substance undergo different alterations, that next the red being always stronger and remaining longer visible than that next the green; the bands of methæmoglobin, however, follow exactly the opposite course under similar circumstances. The author, with Sorly and Marchand, regards methæmoglobin as a higher oxidation product of oxyhæmoglobin, "paroxyhæmoglobin," in opposition to Hoppe-Seyler's view that it is an incomplete reduction product of oxyhæmoglobin, standing midway between the latter and hæmoglobin. Hoppe-Seyler finds his theory on the fact that, on adding palladium hydrate, a reducing agent, to oxyhæmoglobin, methæmoglobin is obtained. Jäderholm confirms this observation, but affirms that it is inconclusive, as methæmoglobin is similarly formed on adding an oxidising agent, as when a small crystal of ferrocyanide of potassium is dropped in a clear blood solution, air being excluded. And, further, if to a solution of methæmoglobin a trace of sulphide of ammonium, a reducing agent, be added, oxyhæmoglobin is formed.—*Cbl. f. d. Med. Wiss.* 21st August, 1880.

Æsthesiogenic Properties of Certain Woods.—The therapeutic value of certain metals, magnets, solenoids, and of static electricity in hysterical disturbances of the nervous system, particularly in hysterical anaesthesia, is very generally admitted; and it is asserted by some, as Dr. Grasset, that revulsives have sometimes been found to act in the same way. Dr. Dujardin-Beaumetz, in this article, adds a number of woods to the list of substances which have the power of modifying or restoring the sensibility of the skin; by the side of a *métallothérapie* he wishes to erect a *xylothérapie*. He conducted his observations on four hysterical female patients who were under his care in hospital. The following phenomena are said to have been noted on placing a disc of wood on the skin of one of those patients. At first the patient complained of the pressure of the cord which supported the disc; then she felt the disc itself, and if it were now lifted the skin under it was invariably found to be redder and warmer than that of adjoining parts, from punctures made here to test the sensibility of the skin blood began to flow, and the return of sensation to every part of the zone in which the wood had

pressed was announced ; no transference of the anaesthesia to the other side, however, was obtained. As the result of his investigations the author meantime concludes (1), that certain woods, applied to the skin, possess manifest æsthesiogenic properties ; (2), that the most active of these is cinchona bark, sensibility returning more speedily than by the use of metals, and not only to the zone with which it was in contact, but also to the skin for a considerable distance round it ; (3), that arbor vitæ, rose wood, mahogany, pitch pine, walnut, maple, apple wood, exercise a similar influence, but with these the persistence of sensibility is shorter, and often a few minutes after their application anaesthesia is as complete as before ; (4), that some woods, such as the poplar, ash, palissandre wood, and sycamore, have no such power. The author does not attempt to explain these observations, but decisively rejects the English view, which regards them as the result of expectant attention. Whether we have here to deal with chemical or electric phenomena, such as those which are known to be developed when metals are applied to the skin, or with the effects of an electric current set up by the difference in temperature and conducting power of wood and skin, or, as some have suggested, with the effects of modification of the nervous vibrations, he does not profess to have decided, leaving the settlement of these questions for further investigation.—*Bull. Gén. de Théráp.* 15th August, 1880.

Significance of Tuberclæ.—Dr. D. J. Hamilton, of Edinburgh, gives the following as the conclusions at which he has arrived in regard to the significance of tubercle :—

- 1st. That it is merely a form of connective tissue growth.
- 2nd. That it is caused by an intense irritant acting upon the connective tissue, probably of the nature of a ferment, produced in the softening of a caseous mass.
- 3rd. That this is carried embolically into different parts of an organ, and stimulates them locally.
- 4th. That the tubercle at first has a close resemblance to a sarcoma, but that when the irritation has subsided, the connective tissue elements organise and give rise to fibrous tissue.
- 5th. That the ultimate destiny of the tubercle nodule is to produce a small fibrous tumour.
- 6th. That the presence of the giant cells is merely an evidence of the return of the irritated connective tissue elements to their embryonic type.—*The Practitioner.* August, 1880.

Benzine and Benzol.—Dr. W. G. Smith observes that medical men should be aware of the difference that exists between these two substances. "Benzine," "benzene," "benzol," and "benzoline," are all terms employed in commerce; of these the hydro-carbon *benzol* or *benzene*, C_6H_6 , is the chief and characteristic constituent of coal-tar naphtha, while it is present in very insignificant amount in petroleum spirit or mineral naphtha. The similarity of these names is apt to cause confusion. Dr. S. quotes, from *Pharm. Journal*, a tabular statement of the differences between these substances:

Petroleum Spirit, "Benzoline," or "Benzine."

1. Consists of *heptane*, C_7H_{16} , and its homologues.
2. Heptane contains 84 per cent of carbon.
3. Burns with a somewhat smoky flame.
4. Commences to boil at 54° to 60° C.
5. Specific gravity .69 to .72.
6. Smells of petroleum.
7. Dissolves iodine, forming a solution of a raspberry-red colour.
8. Does not sensibly dissolve pitch, and is scarcely coloured by it, even on prolonged contact.
9. When shaken in the cold with one-third of its volume of fused crystals of absolute carbolic acid, the latter remains undissolved.
10. Requires two volumes of absolute alcohol, or four or five volumes of methylated spirit, of .828 specific gravity, for complete solution at the ordinary temperature.

Dublin Journal of Med. Science. September, 1880.

Detection of Fuchsin in Wines.—Dr. V. Wartha recommends three tests for this purpose. 1. The magnesia test: if 20 cubcm. of the wine be shaken up with a little magnesia, and then with 1 cubcm. of a mixture of equal parts of ether and amyl alcohol, the layer of fluid which falls to the bottom

Coal-Tar Naphtha, or "Benzol."

1. Consists of *benzene*, C_6H_6 , and its homologues.
2. Benzene contains 92.3 per cent of carbon.
3. Burns with a very smoky flame.
4. Commences to boil at about 80° C.
5. Specific gravity about .88.
6. Smells of coal-tar.
7. Dissolves iodine, forming a liquid having the colour of a solution of potassium permanganate.
8. Readily dissolves pitch, forming a deep-brown solution.
9. Miscible with absolute carbolic acid in all proportions.
10. Miscible with absolute alcohol in all proportions. Forms a homogeneous liquid, with an equal measure of methylated spirit of .828 specific gravity.

after standing for a short time has a rosy-red colour. 2. The acetate of lead test: if 20 cubem. of the wine be shaken up with half that quantity of liq. plumbi subacetatis and filtered, the filtrate takes a reddish tinge from the fuchsin, and communicates the same to the mixture of ether and amyl alcohol on agitation. 3. If neither of these procedures gives any definite result, 200 cubem. of the wine should be evaporated to one-fifth its original volume, strongly alkalised with ammonia, and gently shaken up with 30-40 cubem. of ether; the etherial extract should be poured into a porcelain vessel, a few strands of white wool laid in it, and the ether allowed to evaporate gradually. The wool becomes red if the wine contain fuchsin.—(*Ber. d. Deutschen Chem. Ges.*, xiii, p. 657.) *Cbl. f. d. Med. Wiss.* 28th August, 1880.

Treatment of Urethritis by Chlorate of Potash.—Dr. J. P. Zeitlin has used this remedy in 14 cases of uncomplicated urethritis in doses of 3 grammes (about 45 grains) per day, with excellent results. Even after the first few doses the discharge diminished in quantity and became thinner, while the pain and secretions ceased. No evil consequence followed this treatment. The author ascribes this rapid good effect of the chlorate to the fact that the salt appears unchanged in the urine and acts locally on the mucous membrane.—(*Wratsch.*, No. 14, 1880.) *Cbl. f. Chirurg.* 28th August, 1880.

Equalisation of Doses in Medicine: Posological Preparations.—Dr. Oscar Oldberg, Medical Purveyor, U.S. Marine Hospital Service, makes a proposal which, considering its simplicity and obvious convenience, is worthy of attention; it is a wonder it has not been made sooner. The medicinal agents prescribed by physicians number about a thousand, and their average adult doses range from about $\frac{1}{300}$ of a troy grain to several troy ounces, from less than a minim to more than one fluid ounce. The doses of the commoner remedies the prescriber carries in his memory, those of substances he is less in the habit of using he obtains from books as he needs them. But how greatly would his labour be lightened, and safety and convenience in prescribing be ensured, if the posological strength of all preparations of the same kind were alike. Thus, Dr. Oldberg suggests that the tinctures of potent drugs should be weak tinctures, those of less active remedies strong tinctures, in such a way as to make the doses of tinctures uniform; and so with other preparations. The proportion of active con-

stituent to diluent or menstruum should be in inverse ratio to the posological potency of that active constituent. Most drugs and preparations can be diluted, or concentrated, or prepared in such a way that uniformity of dose could easily be secured. For such substances as opium, morphia, strychnia, podophyllin, &c., the author proposes a class of preparations named *lactosa*, in which the ordinary dose of these substances is diluted with as much sugar of milk as will make the quantity up to the usual dose of the lactosa. This involves, of course, the adoption of a hypothetical average dose of each drug, but there is nothing that is really objectionable in this, and, as a matter of fact, this has been already done in the British Pharmacopeia. It is not intended to say arbitrarily that, for instance, the dose of opium is 1 grain, and not a particle more or less, but for the purpose of making preparations, the name of which shall indicate their dose, it is convenient to assume that such is the case. The elasticity of a dose, or the freedom with which the practitioner may give more or less of a drug, is not abridged in any way, while the advantage of knowing at once the dose of every substance prepared in this way is obvious. Dr. Oldberg also shows that the adoption of this plan would carry with it substantial advantages to the pharmacist as well as to the prescriber.—*New Remedies.* August, 1880.

Menstruation during Pregnancy.—Dr. Levy here (*Arch. f. Gyn.*, xv, p. 361) considers, first, the physiology of menstruation, and gives a review of the literature having reference to menstruation during pregnancy, and then states at length his experience in this matter, derived from the investigation of ten cases. In six of these cases there was disease of the cervix, in one the patient aborted, in another the child died in utero, while a third patient suffered from recent syphilitic disease. In all ten cases, menstruation in general was very irregular, while during pregnancy there was only an occasional loss of blood for 1-1½ hour. Levy holds that what is called menstruation during pregnancy is simply pathological bleeding, and that such changes of the inner surface of the uterus as accompany genuine menstruation would be certain to disturb the course of the pregnancy.—*Cbl. f. d. Med. Wiss.* 31st July, 1880.

Value of Salts of Ammonia, &c., in Diabetes.—It has been shown by various authors that salts of ammonia are eliminated by the carnivora and herbivora in the form of

urea, and Adamkiewicz has shown that this is the case also in the human subject. On the theoretical ground that salts of ammonia might also diminish the quantity of sugar voided in the urine, the latter investigator proposed to employ them in the treatment of diabetes, and published several cases in which they seemed to have this action. Dr. P. Guttmann, physician to the Baraken-Lazareth, Berlin, tried this method of treatment in a diabetic patient, with the following result: During the first five days, in which no medicine was given, the average amount of sugar excreted per day was 231·65 grammes; during the succeeding thirty-one days, in which ammoniacal salts were given freely, it was 223·11 grammes per day; while during the immediately subsequent period of thirty-one days, in which no medicinal treatment was pursued, it fell to 173·19 grammes per day. These figures tend to show that the salts of ammonia not only do not lessen the excretion of sugar, but perhaps even augment it. The same case also was afterwards treated by the Carlsbad water (Mühlbrunnen), and carefully observed for thirty days, with the result that the loss of sugar was not in the least diminished, but rather increased.—*Berlin. Klin. Wochenschr.* No. 32. 1880.

Weight versus Measure: the Metric System.—Mr. R. Rother gives utterance to an energetic protest against the tendency, which is becoming too fashionable, to the adoption of radical changes in the Pharmacopœia, especially such changes which come to us with a Continental recommendation. He objects specially to the proposal to compound everything by weight; and on three grounds:—

1. The uncertainty of the resulting volume; the uniform use of weight at once destroys the relativity of standards, since liquids of all kinds *are consumed by measure*; hopeless intricacy would at once result in the matter of posology, and the necessary use of tables would only render the confusion worse confounded.

2. The unrestricted method of weighing all liquids would entail an enormous waste of time and labour. Particularly in the compounding of prescriptions would this be felt. “The continual running to and fro with bottles to weigh out some of the contents; the constant shifting of weights in taring the vessels and making the successive weighings; the serious damage, and consequent impairment of accuracy, done to balances of all kinds by the ceaseless overloading with weights; the necessity of having more apparatus and the loss of material adhering to it; but, above all, the risk of

fatal error so easily incurred by the complications of a routine which, above most things, should be so simple and direct as to ensure the greatest certainty, are some of the disadvantages of the threatened system."

3. In the laboratory the drawbacks would be equally numerous. The confusion caused by the repeated taring of vessels, the constant calculations, the misplacement of weights and interchanging of vessels, the frequent weighing of portions of filtrates, percolates, and fragmentary products, would be the fertile source of fallacy and failure. All this would require more varied and plentiful apparatus, involving breakage and general waste.

As for the proposal to designate all quantities by parts, and on a decimal scale as a preliminary to the metric system, the author is equally strongly opposed to it. Only those who have operated on both systems can appreciate the convenience of the octaval system, and its frequent culmination in large and distinct units; its simplicity is due to its capability of unlimited bisection. The presumed simplicity of a decimal scale, and consequently of the metric system, is an illusion. It admits of but one bisection, and then a complexity begins from which only a specially endowed mathematical mind can extricate itself with any certainty. Important relations, which are distinguished only by a decimal point or numeral place, are very insufficiently indicated. The resemblance between the drachm and ounce symbols is serious enough, but it is especially unfortunate to rest all distinctions of quantity upon the relative positions of a mere dot.—*New Remedies.* August, 1880.

Boro-Citrate of Magnesia as a Solvent of Urinary Calculi.—Köhler recommends the boro-citrate of magnesia, obtained by dissolving the borate of magnesia in citric acid, as a remedy for uric acid calculi and vesical catarrh. He prescribes one part of the salt mixed with two parts of sugar, flavoured with a drop of essence of citron; of this a teaspoonful should be taken three times daily.—(*Berl. Klin. Wochenschr.*) *Lyon Médical.* 22nd August, 1880.

On a New Method of Treatment of Relaxation of the Membrana Tympani, by Dr. M'Keown, Belfast.—At the Meeting of the British Medical Association at Cork, in August, 1879, Dr. M'Keown read a paper on the above subject, in which he stated that he had found the application of collodion to the membrana tympani of marked benefit. He only applied the

collodion twice, and the improvement was such that the patient heard at eighteen feet, an increase of fifteen, and the distressing noises from which she suffered disappeared. Writing in March, 1880, the improvement is stated to have continued, and Dr. M'Keown considers that the above is well entitled to a careful trial, all the more so that since his first case improved so much he has used the new treatment in a large number of cases, and with the best result.—*Dublin Journal of Medical Science*. June, 1880.—J. C. R.

Treatment of Syphilitic Diseases by Pilocarpin.—Dr. G. Lewin treated 32 patients suffering from syphilis in various forms, by subcutaneous injections of pilocarpin. Of these 25 got well, 78 per cent—this number including not merely the slighter cases, but also several of great severity, amongst others one of gummosus periostitis. The duration of the treatment was from fourteen to thirty-four days; the average total quantity of the drug administered was .372 grm., 15 mgrm. being given in each injection. The number of injections was proportioned to the intensity of the disease. Notwithstanding these results the author gives preference to his system of treatment by injection of corrosive sublimate, the duration of treatment by this means being shorter, its effect more certain, and its drawbacks fewer than by any other method.—(*Charité-Annallen*, vol. v, p. 489.) *Centralblatt f. d. Med. Wiss.* 19th June, 1880.

Hydrobromic Ether in Labour.—In some instances in labour, both ether and chloroform will produce, in certain females, so much relaxation, that if there is the slightest tendency to haemorrhage it will be very much increased. To test the influence of hydrobromic ether (bromide of ethyl), Dr. Turnbull, of Philadelphia, administered it on 24th February, 1880, to a lady, aged 30, who had a narrow pelvic outlet and a very rigid os uteri, and who had been in labour with her fourth child for nine hours, having made but little progress. The hydrobromic ether was used in tablespoonful quantities, when the pains were most intense and distressing; it gave as prompt relief as ether, and yet did not in the least interfere with the expulsive efforts. The pulse was only increased six beats; there was no apparent disturbance of respiration, only a feeling of fulness in the chest. Child was born full of life and vigour, and cried lustily. The perinæum was slightly lacerated, as the occiput was pressed strongly on the tissues. Not a single bad symptom followed from the use

of this form of anaesthetic, and there was no sickness. The whole quantity employed was five tablespoonfuls. There was no haemorrhage, and the placenta was expelled with but slight traction. This is stated to be the first time that this agent has been used for this purpose.—*Independent Practitioner*.—*Dublin Medical Journal*. August, 1880.

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Fig 1.



Fig 2.



Fig 3.

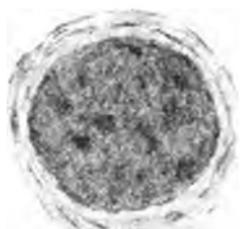


Fig 4.





Fig. 5

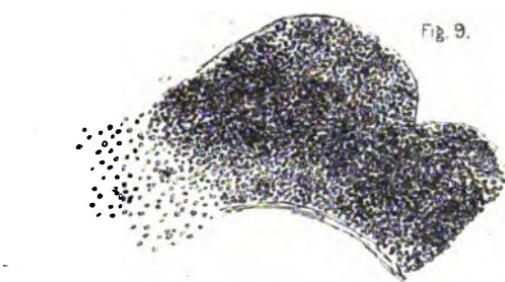


Fig. 9.

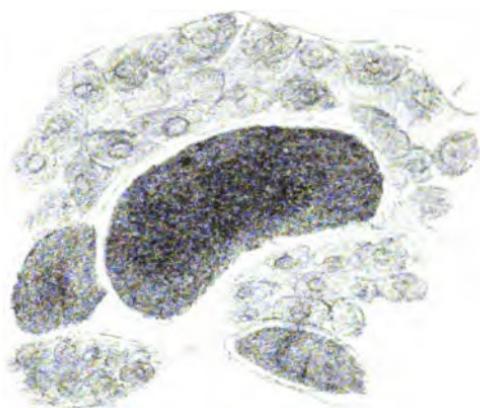


Fig. 8

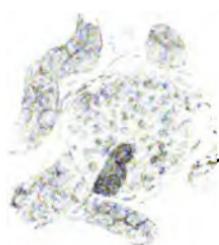


Fig. 6



Fig. 7

THE
GLASGOW MEDICAL JOURNAL.

No. XI. NOVEMBER, 1880.

ORIGINAL ARTICLES.

DIAPHRAGMATIC HERNIA.

By JAS. A. ADAMS, M.B.,
Demonstrator of Anatomy in the University of Glasgow.

(*With a Lithographic Plate.*)

THE great rarity of diaphragmatic hernia is evidenced as well by the limited number of cases which have been recorded as by the care which qualified observers have shown in describing the instances that have come under their notice.

The following case is therefore, I think, worthy of being added to the record, although the conditions are such that I am unable to give the history of any symptoms which may have existed during life, or of causes which may have originated the pathological changes observed after death.

The body of a man, aged 49, was received into the Glasgow University Anatomical rooms last session. The official certificate stated that he had died of bronchitis. With the exception of some evidence of intestinal peritonitis of old standing, together with the conditions I am about to describe, there was nothing else abnormal observed throughout the body.

Notwithstanding my careful enquiries, I was unable to obtain any information regarding the man's occupation, his ordinary state of health, or the symptoms of his fatal illness. His history was a blank.

In the chest there was found a tumour which pressed the left lung upwards, rising as high as the fourth rib. This tumour, when traced downwards, was found to pass through

the diaphragm and to be attached by its base to the upper surface of the spleen. It lay in a cavity bounded above by the base of the left lung; below by the superior surface of the diaphragm; and firm adhesions between the edge of the lung and diaphragm completed the walls of the enclosing cavity.

A considerable quantity of white, curdy, grumous matter, intermixed with calcareous deposition, lay in this cavity.

The tumour itself, somewhat conical in shape, with the apex upwards, was of whitish colour, of shaggy exterior, and was studded over with calcareous particles. It was very firm to the touch.

The left lung was, as I have said, pressed upwards as high as the fourth rib, and the base was solidified to a considerable extent. The basilar pleura of this lung was thickened from old inflammation. The abnormal opening in the diaphragm was bounded by a thin, sharp, and smooth margin. This thin edge or margin grasped the intruding tumour firmly causing a deep sulcus as if compressed by ligature.

On external examination the growth seemed to form part of an enlarged spleen protruding through the diaphragm and somewhat altered in consistence and external appearance. A vertical section, however, showed that the spleen itself still lay within the abdomen, and that the tumour grew from the thickened splenic capsule, which distinctly separated the normal splenic tissue from the new growth.

The microscopic examination did not yield very decided results. The tumour seemed to be entirely composed of structureless layers of lymph. To the unassisted eye the laminated appearance which the mass presented on section reminded one forcibly of organised blood clot in aneurism.

How this condition originated can only be conjectured by considering the causes that usually give rise to phrenic hernia.

Diaphragmatic hernia may be described as occurring under two forms, and these may be classified as *true* and *false*. True phrenic hernia takes place through one of the *normal* openings that exist in the diaphragm, while false phrenic hernia occurs through some abnormal opening formed by separation or laceration of the muscular fibres, or from an insufficiency of the septum.

True phrenic hernia, in passing upwards through some of the normal apertures in the diaphragm, usually is found to have a sac of peritoneum, and to be covered externally by pleura. Of this the rarest form there are very few cases recorded. Morgagni describes a case* where the stomach, duodenum, ileum,

* *Eph. Nat. Cur.*, Book iv, sect. liv, vol. iii, p. 210.

and omentum passed upwards through the œsophageal aperture.

In three instances viscera have protruded through an aperture that transmitted an intercostal nerve. Platner has recorded* one of these. Besnier a second,† and a third is narrated in the *Lond. Path. Transactions.*‡

Behind, and on each side of the xiphoid cartilage, there exists a deficiency of the diaphragm, filled up by cellular tissue. This weak spot may be the site selected by a hernia. Sir A. Cooper describes a hernia in this situation,§ and a similar case is narrated by Bignardi.||

In a patient who died of scirrhous cancer, Dr. Hill ¶ found an opening about the size of half-a-crown in the diaphragm, one and a half inches behind the vena cava. This was the neck of a sac lined with peritoneum, which projected into right pleura, and which sac contained the stomach and omentum. The sac was covered by pleura. Dr. Hill thought that the opening corresponded to the œsophageal one.

False or spurious phrenic hernia is by far the most common. It is most frequently the result of violence, such as is occasioned by falls from a height, by blows from a falling body, by a crushing force, as when jammed between the buffers of railway carriages, or by penetrating wounds of the abdomen. When the result of such forms of violence, the lesion is usually one of many, and the injured individual, as a rule, succumbs immediately, or drags on a short existence in a semi-conscious condition. But death does not always ensue so rapidly. Dr. Reid,** in discussing the question of wounds of the diaphragm, quotes four cases. In the first, recorded by Ambrose Paré, the patient lived eight months after such a wound, in the second eleven months elapsed, in Dr. Reid's case fifteen months elapsed, and in the fourth, Mr. Greetham's, four years.

In Dr. Baillie's collection at the Royal College of Physicians there is a preparation from a case where the patient lived two years after laceration of the diaphragm and fractured ribs.

Dr. A. T. Thomson narrates a case †† of a man living nine months with ruptured diaphragm, and Dr. M'Fadyen, of

* *Eph. Nat. Cur.*, Book iv, sect. liv, vol. iii, p. 206.

† *Des Etranglements internes de l'intestines.* Paris, 1860, p. 225.

‡ Vol. xxx, No. 352.

§ *Key On Hernia*, p. 69.

|| *Sull. Ernia Diaphragmatica Memoria.* Modena, 1827.

¶ *Lond. Path. Trans.* Vol. xxi, p. 154.

** *Edin. Med. and Surg. Jour.* Vol. viii, p. 42, and vol. liii.

†† *Lond. Med. Gaz.* Vol. v, p. 583.

Glasgow,* a case of a slater who, from a fall, sustained a similar injury, and lived twelve months after.

But even more extraordinary cases will be found on record. Thus, M. Derricagaix † published an account of a carpenter who fell from the Dome of the Invalides, and after remaining in a critical condition for some time, recovered, but continued to suffer from pain in the left side and dry cough. Fifteen years after, he died, and on a *post-mortem* examination being made, the stomach and arch of the colon lay in the thorax, where they had formed old and firm attachments.

Mr. Morgan ‡ performed a *post-mortem* on a man who had been struck sixteen years before on the abdomen, by a tree, and who, from that time till his death, suffered from dyspepsia and dyspnœa. He found that the stomach, small intestines, omentum and spleen, lay in the left pleural cavity, and had formed firm adhesions there.

The case that Dr. Peacock founds his excellent monograph § on is not unlike this last one. His patient died of typhus fever at the age of fifty. Several years previously he had been crushed between railway buffers, but excepting a little shortness of breath he had been able ever since to continue his occupation of porter. An opening on the left side of the diaphragm, large enough to admit the hand, was discovered *post-mortem*, and through this aperture the stomach, spleen, transverse colon, and most of the small intestines had escaped into the thorax, where they had remained and compressed the left lung upwards.

Dr. Murchison || gives an elaborate account of a case somewhat similar to Dr. Peacock's, but the opening was on the right side of the diaphragm, and the whole right hepatic lobe with the gall bladder lay in the thorax. The diaphragm grasped and constricted the liver.

These examples embrace nearly all the cases I find recorded, with the exception of a few where the data were not to my mind quite satisfactory. Ere leaving this part of the subject, however, I cannot forbear mentioning a curious pathological condition which Dr. W. Morrant Baker ¶ found in a man who had died of pyelitis. A very small opening in the diaphragm allowed a piece of the great omentum, as large as "the

* *Edin. Med. and Surg. Jour.* Vol. xix, p. 282.

† *Journ. de Chir. par Dessault*, 2me. Année. T. 3me, p. 9.

‡ *Lond. Med. Gaz.* Vol. xii, p. 673.

§ *Trans. Path. Soc. Lond.* Vol. xiv, p. 146.

|| *Lond. Path. Trans.* Vol. xvii, p. 164.

¶ *Lond. Path. Trans.* Vol. xviii, p. 58.

outstretched fingers and hand," to pass into the pericardium, where it lay over the heart. There were no abnormal heart sounds observed during life. From a scar at the fifth intercostal space Dr. Baker attributed the lesion to an old stab, though unfortunately no history could be gleaned.

This exhausts the cases of phrenic hernia due to wounds or lacerations of the diaphragm; but there still remains to be considered a large and important class of false phrenic herniæ, where the protrusion is due to deficiency of the diaphragm from arrest of development or imperfect local nutrition. Where this strange pathological condition has been observed in infancy or early life, we do not wonder at death occurring ere the child arrives at maturity. Dr. Hillier* has published a narrative of a child aged six months that came under his care suffering from obscure symptoms. *Post-mortem* the small and large bowel, as far down as the descending colon, were found in the right pleura, having gained access to that cavity by an opening one inch in diameter, which lay in the right ala of the diaphragm. No congestion or irritation existed. The lower half of right lung was condensed, and the sternum arched forwards. Dr. Macaulay† and Dr. Fothergill‡ record somewhat similar cases.

Though the large majority of such cases die in infancy, such is by no means always the case. Some of the individuals so affected have shown no symptoms that attracted special notice; on the contrary, have lived active and even laborious lives, and died from causes in no way connected with their congenital defect.

As illustrating this class, I may refer to Dr. John Reid's publication; § to Dr. Bowditch's|| case that died of fractured spine at the age of 17; to Dr. Patterson's ¶ (Ayr) case, in a female aged 22; to two cases recorded by Riverius; ** to a case of a man aged 40, by Petit; †† to a description of a *post-mortem* examination on a Lieutenant-Colonel, by M. Chauvet; ‡‡ and to that of an old man, by Veters. §§

These recorded cases, though few in number, demonstrate

* *Trans. Path. Soc.* Vol. xii, p. 115.

† *Med. Obs. and Enq. by Soc. Phys. Lond.* Vol. i, p. 26.

‡ Lettsom's Works. 1784. P. 161.

§ *Ed. Med. and Surg. Jour.* Vol. liii, p. 104.

|| *Treatise on Phrenic Hernia.* 1853.

¶ Munro's *Morbid. Anat. of Gullet, &c.* P. 540.

** *Obs. Med. et cur. Centuria.* iv, lxxvii, p. 69.

†† *Traité des Malad. Chir.* T. ii, p. 229.

‡‡ *Mem. de l' Acad. Royale des Sciences.* P. 2.

§§ *Aphorismen aus der Pathologischen Anatomie.* P. 144.

the fact that it is quite possible for an individual affected with either true or false phrenic hernia to enjoy tolerably good health.

In the case that forms the basis of this communication, it was quite evident from the pathological changes that the lesion was of old date. There was not the slightest trace of recent peritonitis, pleurisy, or inflammation of any kind. The thin smooth edge of the phrenic opening, the adhesions between it and the edge of the lung at its base, the solidified base of the lung, and the calcareous deposition on the surface of the tumour with the fluid contained in the cavity, all indicated changes that demanded a considerable lapse of time for their fulfilment.

That the hernia may have had something to do with the man's death I think is extremely probable. With one lung practically almost useless he would run a greater chance of succumbing to any affection of the sound one.

From the unfortunate fact that no history exists of any injury or of any symptoms, we have difficulty in deciding what was the *origo mali* in this case.

The case is evidently one of false phrenic hernia, but of a very peculiar and, as far as I can ascertain, unique kind.

We find a peculiar affection of the splenic capsule, to which Mr. Canton * has given the name of fibroid degeneration, in a case he has put on record. Dr. Bristowe, in his careful microscopical report on Mr. Canton's case, stated that the tumour had a close uniform texture. That it was tough, stratified in direction parallel to the surface of spleen, and could be peeled off in successive layers. As to the cause of its being so stratified "he does not venture to decide." His description tallies closely with the conditions found in the present case.

We must keep clearly in mind the anatomical relations of the spleen, especially the attachments that prevent the gland from descending in the abdomen, and, in fact, hang it up close under the diaphragm.

A tumour arising from the upper surface of the splenic capsule could not grow downwards unless it involved the splenic tissue. I have already stated that the gland itself was quite healthy, and that the disease was distinctly limited to the capsule. Now, although the tumour itself could not grow downwards or press the gland down in the abdomen, it could grow upwards till it reached the under surface of the diaphragm. The spleen crushed under the growth would not retain its usual shape, and we actually find in this case that

* *Path. Trans.* Vol. xiii, p. 241.

it was distinctly flattened. The continual pressure upon the diaphragm would more or less impede its nutrition, and sooner or later the tumour would cause absorption of the septum or insert itself between the fibres, or the weakened diaphragm might suddenly yield under some violent explosive effort.

I do not assert that this was the true sequence of events, but I propose this view as the most probable explanation deducible from the facts.

PRACTICAL PAPERS ON THE MATERIALS OF THE ANTISEPTIC METHOD OF TREATMENT.

By GEORGE BEATSON, B.A. (Cantab.), M.D. (Edinb.)

VII.—ON SPONGES AND ANTISEPTIC DRAINAGE.

(*With six Woodcuts.*)

IN the present paper it is my intention to speak of the all important subject of the *drainage* of antiseptic wounds; but before doing so I think it advisable to direct attention to some points of detail connected with the use of sponges in Lister's system, as it is very necessary to have them specially prepared and properly attended to during the conduct of a surgical operation, carried out antiseptically.

Sponges (Latin, *Spongia*).—After considerable diversity of opinion among naturalists as to the real nature of the sponge, it is now agreed on all hands that, though a creature of low organisation, it belongs to the animal kingdom. It has been defined “as a flexible, torpid, polymorphous animal, composed of reticulate fibres, or masses of small spires interwoven together, and clothed with a gelatinous flesh, full of small mouths on its surface, by which it absorbs and ejects water.” No doubt the above definition is comprehensive enough, and includes all its chief characteristics, but it does not sufficiently bring out the practical fact that the structure of a sponge consists of a horny elastic and sometimes calcareous *skeleton* or frame-work, of diversified form and arrangement, which supports and connects a *body* composed of a gelatinous flesh termed *sarcode*. It is this skeleton or framework, freed from sarcode, which makes up, by its fine flexible tenacious fibres, interwoven in the form of cells and meshes, the yellowish-brown, porous masses, of varied shapes, which represent the ordinary sponges of com-

merce. These are usually obtained from the Mediterranean Sea, where they are found in deep water, adhering to shells or rocks, and are usually brought to the surface by divers, many of whom are most expert in their vocation, being trained to it from boyhood. Of the two hundred and fifty different species of sponge, only three are met with in commerce, two being from Turkey and one from the West Indies. These latter are large and coarse and are not equal in quality to the former, which are much finer and more thought of. Smyrna is the great market for Turkey sponges. A sponge that has been fished up and has been perfectly dried, is so very light that large pieces of it can be moved by the slightest breath of air; but it never reaches the public in that condition, and that is due to the following reasons. As I mentioned above, when a sponge is taken living from the sea, it is completely filled and covered with gelatinous sarcode. The first step is to get rid of this, and that is done in various ways, but the usual plans are either to cause it to separate by rubbing the sponge with fine sand, or to bury the sponge for some days in the sand until the animal matter rots, and then the horny keratose of the framework is soaked in water and washed. Whichever method is adopted the sponge of necessity becomes filled with sand, and we find that this is one of the chief impurities of imported sponges. When we remember that these articles are sold by weight, we can understand that the presence of a considerable quantity of sand in them is not disadvantageous to the sellers of them. Hence we find that some of them purposely introduce it, and they do so by the following procedure. They string the sponges together and lay them on the sand just at the edge of the tide to allow the ripple of the sea to slush them with the finest particles. They are then placed under piles of stones, which press them closely together so that they become hard and flat. After that they are beaten and sifted, and in some cases even re-washed, but though to all appearance quite clean, yet they weigh three or four times more than their original weight. It is not to be wondered at that disputes are of common occurrence between the small importers and the wholesale buyers, and as a consequence there exist certain agreements between them as to whether or not the sponges are to be beaten to free them from the sand, and if so, the length of the stick to be used and the number of minutes it is to be employed are all laid down. The above are the reasons why we seldom or never find the sponges of commerce free from sand, unless we purchase them after they have undergone that special preparation which they need to

render them soft and fit for the uses to which they are put in medicine. These uses are entirely of a surgical kind, and the qualities which render them so serviceable to the surgeon are their porousness, softness, elasticity, and power of imbibing fluids and as readily giving them out again on compression. This led to their employment formerly in dressing wounds, where they served as a means of conveying water to the part, or of removing any matter or discharge which might be adhering to the surface of the wound. It was soon found that there were grave objections to such a mode of using sponges, for, owing to their expensive nature, they had to be used over and over again, and the difficulty of cleaning them was so great that they were often the means of conveying mischief from one wound to another. As a consequence they were restricted to surgical operations, where they are of great service in absorbing the blood which would otherwise be apt to conceal the parts from the surgeon's view. It is in this capacity that they have a place in Lister's system, though, under certain circumstances, to be mentioned hereafter, they are made use of as an aid to the drainage-tube in preventing the accumulation of blood in wounds having a considerable cavity.

From the preceding remarks it will be seen that sponges require some preparation, even when new, to fit them for surgical use, and that when once used, owing to their expensive nature, they must be employed again, but can only be so after a thorough cleansing. This leads me to describe the two following points:—(1) the preparation of new sponges, and (2) the best method of cleansing soiled ones.

Preparation of New Sponges.—When intended for surgical purposes, the lightest, softest, finest, and most elastic sponges, with the smallest holes, should be selected. These will be those brought from the Levant, of which there are two varieties, (a) honeycomb, and (b) fine Turkey or cupped, known also as toilette sponges. The former are coarser, rougher, and firmer than the latter, which are the ones used for operations. They vary in price; but excellent ones can be got at about 7s. per lb. Such sponges, unless they have been specially prepared for the market, will be found to be full of impurities, chief of which, as I said before, is sand; but in addition there will be numerous minute fragments of coral or stone, or small shells, all of which unfit them for use. The best plan to get rid of these is as follows:—When the sponge is in its dry state beat it so as to loosen and drive out all the sand and break up any concretions which it may contain. Then macerate it for some days in cold water, which should be changed at intervals,

until it comes off quite free of sand; and each time it is changed the sponge should be pressed perfectly dry. Should there be any calcareous matter left, such as any small pieces of chalk and shells, which cannot be extracted without tearing the sponge, it should be soaked for twenty-four hours in muriatic acid diluted with thirty parts of water. It should then be rinsed thoroughly in cold water, or water with sulphurous acid in it, one part to fifteen, which will further whiten or bleach it. In fact, the *white or bleached sponge* of the shops is prepared in the above way. The great objection to the use of acid in connection with sponge is, that though it gives it a good appearance it acts injuriously on it and deteriorates its quality. Having, by this process, rendered the sponge perfectly soft and fit for surgical use, the next step is to render it antiseptic, and this is best done by allowing it to dry and then to soak for at least a week in a lotion of 1-20 carbolic acid, placing it in one of the ordinary household earthenware jars, furnished with a lid, which prevents evaporation of the acid. After this it is quite ready for use in any operation.

Preparation of Soiled Sponges.—After being used in an operation, or for any surgical work, it is necessary to cleanse sponges thoroughly before employing them again, and it is essential that this cleansing be of a very complete nature, to prevent the possibility of conveying mischief from one case to another, for it is not difficult to see how sponges, used at a septic case and not properly cleaned, might very easily introduce the causes of putrefaction into the next case where they were employed. There are several methods in vogue for cleansing soiled sponges, but I will confine myself to two, one of which is that followed by Mr. Lister in his private practice, and the other is that which was in vogue in his clinical wards in the Edinburgh Infirmary when I served under him. Taking the former first, Mr. Lister's description of it is as follows:—“The sponges, after being used for an operation, are put into a vessel of water, and left there till the fibrine in their pores has been converted by putrefaction into a slimy liquid which can be readily washed out. They are then squeezed in successive portions of water till they cease to discolour it, and, after having been well wrung, they are thoroughly moistened with the 1-20 watery solution of carbolic acid. The sponges, after being so treated have, very likely, a decided putrefactive odour clinging to them, but this is a matter of small moment. The presence of a little of the *products of putrefaction* will do no harm if the *causes* of the fermentation have been destroyed.”

(*Lancet*, 3rd April, 1875.) The second method which I would recommend is carried out as follows:—The soiled sponges are soaked for twenty-four hours in a solution of the common muriatic acid and water, of a strength of 1-8. This cleanses them thoroughly from blood, oil, or any other impurity that may be present in them, and renders them quite white, after which they are washed in warm water, which is changed two or three times, the sponges being squeezed and pressed with the hand each time. They are then placed in an earthenware jar with a lid on it and allowed to soak in 1-20 watery solution of carbolic acid until required. There are other modes of cleansing and whitening sponges which are equally efficient; but I have given the above, as I know from practical experience it is quick, easy, and reliable.

Did space allow, there are several other matters connected with the preparation of sponges and their use in antiseptic operations that I would like to dwell upon, as I have often seen cases where there was every desire to carry out Lister's system faithfully, marred by carelessness and inattention to the sponges. I would just allude to the following points which should be attended to in dealing with sponges:—(1.) They should never be immersed in boiling water, as it has an injurious effect on them, especially in cooling, causing them to shrink and become hard and tough. (2.) Sponges should never be wrung: it breaks their fibres and injures their elasticity. They should be *squeezed* dry. (3.) In an ovariotomy count the sponges, and on no account allow any of them to be cut during the operation. (4.) When required for an operation the sponges should be removed from the jar of 1-20 lotion in which they were soaking, and be placed in a basin with 1-40 carbolic lotion around them. (5.) As required, they should be handed one by one to the surgeon, being first squeezed quite free from all lotion. (6.) If it is necessary to have a number of sponges lying ready to the surgeon's hand, a towel should be wrung out of 1-20 lotion and laid over the patient near the seat of operation, so as to serve as an antiseptic basis on which they may be placed and be within reach, and also within the area of the spray. It is very risky to lay sponges down anywhere outside of the spray. (7.) The dirty sponges should first be squeezed free from blood into some suitable receptacle, and then washed in the 1-40 carbolic lotion, after which they are again squeezed dry and handed as wanted. (8.) If it can be arranged, it is convenient to have such a number of sponges that they do not require to be used more than once during an operation.

Antiseptic Drainage.—With the consideration of this subject, I come to one of the most important features in Lister's system, as it consists in making adequate provision for the escape of fluids and discharge from wounds. Upon no point in the management of antiseptic cases does Mr. Lister speak with more earnestness and clearness than on the necessity of careful attention to this detail, for increased experience has only gone to confirm the truth of the cardinal doctrine which he has long since laid down—that tension caused by pent up secretions in wounds or cavities is a primary cause of constitutional disturbance and subsequent suppuration. Indeed, it may be asserted that the two leading features in Lister's system are (1) the exclusion of all the exciting causes of putrefaction from wounds, and (2) provision for free escape for all the secretions. To this latter has been assigned the term *drainage*, a word borrowed from agriculture, where it implies the art by which surplus water is carried off from swampy ground, or from any sort of land where its presence is prejudicial to vegetation. It is to the French surgeon Chassaignac, borne at Nantes in the year 1805, that we owe the expression, he having introduced the term, the title of his great work on which his surgical fame rests being *Traité Pratique de la Suppuration et du Drainage Chirurgical*. The idea of drainage as a principle was not brought forward by him, as he himself admits, but in his hands it underwent great improvements, both in its principles and the means adopted for carrying it out, and, as a consequence, it soon occupied a very important position in the treatment of surgical wounds. The chief improvement worked out by Chassaignac was the advocacy of vulcanised rubber tubes, of different sizes, and perforated with holes to allow of the discharge making its way into their interior. Such tubes had been in use before his time, as he himself tells us, but he showed how superior they were to the setons and other materials used as drains, and how preferable they were to the free incisions at that time in vogue for the evacuation of pus, a course of proceeding not free from danger, and which did not always ensure the escape of fluid, but allowed it rather to collect and putrefy, and thus give rise to septic absorption. Chassaignac also dwelt on the advantages of these vulcanised tubes in that they were easy of introduction, excited no inflammation in the tissues by their presence, and allowed of injections being practised through them. Owing to his powerful advocacy of them they have always since gone by his name, both in this country and abroad, although, as I said, others, such as Ferri,

Cloquet, and Baudens, had used them previously. The accompanying illustrations represent Chassaignac's mode of using the drainage tube. Fig. 1 shows its mode of introduction by a curved trochar and canula, while Fig. 2 represents the mode of fastening the two ends of the tube by means of a thread to prevent its slipping out.

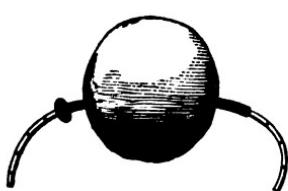


FIG. 1.

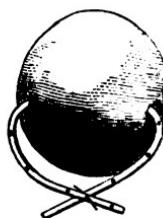


FIG. 2.

While, however, the introduction of the drainage tube did much to facilitate and simplify the treatment of suppuration, Chassaignac, by his treatise on that pathological condition, increased our knowledge of it, and very much enlarged our views upon the question. It was not until 1859 that he published his book upon it, having worked at the subject for several years in the Lariboisière Hospital, but it was at once recognised as a most valuable contribution to surgical literature. His description of such conditions as diffuse phlegmonous inflammation of the cellular tissue, of abscess in the axilla, neck, and other situations, are most striking and life-like, being, as they all were, drawn from actual cases that had come under his observation. Hence it is that he is now known more by his connection with this subject than his method of dressing wounds by occlusion, or his invention of the ecraseur. It is also interesting and pleasing to note how the very principle for which he contended in the *treatment of suppuration* has come to be applied to the *prevention* of that very condition upon which he wrote, for we now drain away serous discharges from wounds so as to avoid tension and hinder them becoming purulent. There has thus been a wide extension of the field of *drainage*, of which perhaps Chassaignac never dreamed, simply because his knowledge as to the exciting causes of suppuration was more limited than ours of the present day, for now we know that mere tension may set up a purulent formation. It is this that leads us to introduce drainage-tubes into our wounds without any delay, so as to favour the flow of fluids from them during the first few hours of their existence. There has been no stronger

advocate of such a practice than Mr. Lister, and it forms a most essential part of his system. Indeed, it is not too much to say that without the principle of drainage for which Chassaignac contended so much in cases where pus had formed, Lister's system of wound dressing would have been incomplete, and would not have yielded the excellent results it has. And it may be as well for me, before I speak of the different modes of drainage in use in Lister's system, to mention here one or two points that must always be borne in mind in connection with the drainage of *antiseptic wounds*. The first point is that, whatever be the antiseptic employed, carbolic acid or chloride of zinc, its action on the tissues increases the amount of discharge. This is amply demonstrated by the fact that it is always the first dressing after an operation that is most soaked with discharge, which goes on lessening day by day, as the antiseptic loses its power, unless any occasion should arise for a fresh application of the antiseptic, when a renewal of the discharge may be expected. Mr. Lister thus alludes to this fact:—"The effusion of plasma which occurs during the first few hours after the infliction of a wound is greater when the cut surface has been treated with a stimulating wash than it is under ordinary management, and unless provision be made for its escape, it will be pretty sure, in a wound of such depth and extent as that of a major amputation, to accumulate in sufficient quantity to cause inflammatory disturbance from tension. On the other hand, when once the antiseptic introduced at the time of the operation has left the wound, provided that irritation be not perpetuated by blood and serum pent up in sufficient quantity to cause disturbance, or by some other accidental circumstance exciting the nerves of the part, such as tightly dragging stitches, we may reckon with confidence on the discharge being trifling in amount." (*Holme's System of Surgery*. Vol. v, p. 625). The other point I would desire to direct attention to is that in *antiseptic* wounds the discharge is of a thin and serous nature, so that it is not necessary to have a drain of large calibre. What is needed is to see that it is placed so as to be able to act efficiently and prevent all accumulation of discharge. How, then, is drainage carried out in Lister's system? Formerly, Mr. Lister was in the habit of using a strip of lint soaked in carbolic oil as a drain, and limiting its use to the first day or two after an operation. This is shown by the following passage, where, speaking of discharge, he says:—"Hence, it is only during the first twenty-four hours that a special provision for its escape is needed, and for this purpose I have found it convenient to

lay in the wound a strip of lint soaked with an oily solution of carbolic acid (one to ten), one end being left hanging out at the most dependent part, to serve as a drain for blood and serum." (*Holme's System of Surgery*. Vol. v, p. 625). Since the above was written, Mr. Lister has considerably extended the period during which he employs drainage, and he has more or less discarded the strips of lint soaked in carbolic oil. Of course, there are certain exceptions where it is the most suitable drain, and of these, abscess beside the rectum is one, where "a bit of lint soaked with carbolic oil is used as a drain, simply because in this situation it is not easy to keep in position a caoutchouc drainage-tube." (*Lancet*, 27th March, 1875). There are, however, three chief methods of draining in vogue in Lister's method at the present time, not all introduced by himself, but that have met with his approval. They are as follows:—(1) By vulcanised india-rubber drainage-tubes; (2) by carbolised catgut; (3) by carbolised horse hair. On each of these three methods I will now make some remarks, taking them in the above order.

(1.) *By Vulcanised India-Rubber Drainage Tubes.*—These are the drainage tubes of Chassaignac, to which reference has been made, and of late years they have been introduced by Mr. Lister into his system with the happiest results. They are composed of vulcanised india-rubber, and they are made by wrapping slips of that material round a solid metal rod of varying size, termed a mandrel, until the desired thickness is attained. They are then placed in a steam heater, at a temperature of about 250° F., by which the rubber is partially fused, whereupon they are removed from the heater and the metal rods withdrawn. They subsequently undergo a finishing process to smooth down any inequalities on their surface. There are some seven sizes of the tubing manufactured, the diameters of which are given in the accompanying woodcut, fig. 3.

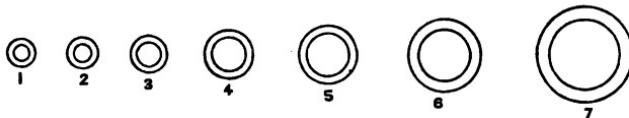


FIG. 3.

Of these sizes, those having an external diameter of $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, and $\frac{1}{6}$ of an inch respectively, are the ones most in use. There are also three varieties of the tubing made, *red*, *black*, and *grey*. Of these, the *red* is by far the most preferable. It is

composed of the best Para rubber, and owes its red colour to the presence of sulphide of antimony, which is introduced just in sufficient quantity to cause the rubber to vulcanise and keep its colour. If any other form of sulphur were used, the rubber would turn white on its surface. The objection to the black variety of tubing is, that it is only semi-vulcanised, and, though made of pure rubber, it becomes hard and loses its pliability, while the grey kind is unsuitable for drainage tubing in that it contains a very small amount of pure rubber, and has present in it a number of different compounds. It is, however, very soft and pliable, as it is thoroughly vulcanised, and its whitish-grey colour is due to the presence of the sulphur used in that process. For all practical purposes the red variety is infinitely superior to the others, and it should be used for drainage tubes. It does not alter its colour in carbolic solution, whereas the black variety soon turns white. The cost of the red rubber varies with the size required, but it runs from 6d. to 1s. 6d. per yard. It can be obtained from Mr. Peter Robertson, india-rubber merchant, Queen Street, Glasgow, who was one of the first to introduce it into Glasgow about five years ago. It is, however, manufactured in London. The black tubing costs nearly the same as the red, but the grey is cheaper, running from 4d. to 1s. per yard.

To allow of the discharges of a wound reaching the interior of the tubes, it is necessary to have lateral perforations in their walls. Holes are accordingly cut in them equal in diameter to half that of the tube. They are placed at intervals, and go spirally round the tubes so as not to weaken them. They may be cut out by means of scissors, or punched out with a special instrument. The ends of a drainage tube require some attention. That in the interior of the wound should be transverse, with a small piece cut out of one of the edges in case the end of the tube should be pressing against any of the tissues, and thus be blocked up. The outer end should be cut transversely or obliquely, according to the nature of the wound or cavity, and it should be flush with the skin, and should not project beyond it, as any part projecting is pressed upon by the dressing, and the function of the tube is interfered with. Were a simple drainage tube, such as the above, to be placed in a wound or cavity, it might either slip inside and become healed over, or it might escape externally. To obviate the risks of such displacement, it is advisable to have two loops of carbolised silk thread, knotted at the ends, attached to opposite sides of the margin of the outer extremity of the tube, as shown in fig. 4, where the tube is cut

obliquely. Such loops are useful also for the withdrawal of the tube when it is necessary to take it out of the wound, and they must also help to keep its orifice open by the traction they make on its edges.

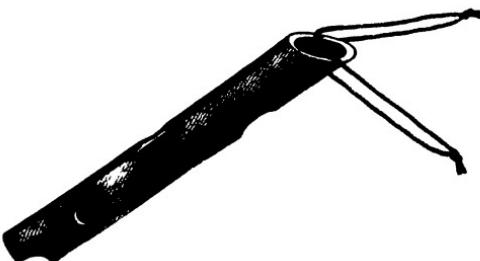


FIG. 4.

The following are Mr. Lister's directions in the matter:—
"Drainage is provided for by the caoutchouc tubes of Chassaignac. In order to prevent the tube from being pushed in too far, we have two loops of carbolised silk attached to the orifice, each of them knotted at its extremity. The orifice of the tube is placed on a level with the skin, and when the dressing is bound down it gets a purchase on these knotted pieces of silk stretched upon the skin, and so the tube cannot leave its position. If the direction of the tube has to be oblique, we cut the orifice obliquely in proportion, so as to have it perfectly level with the surface. If the tube projects it gets bent, and fails to convey the discharge properly." (*Dublin Journal of Medical Science*, August, 1879.)

Having now described the mode of preparing drainage tubes, it might be expected that I should give some rules as to the size of the tubes to be employed; but this is really a matter that depends on the wound itself and can only be learnt by experience. The great thing is to err on the side of having too much dainerer rather than too little. Mr. Lister thinks that "in large and deep wounds, where very free drainage is required, it is convenient, instead of using one tube of very large calibre, to insert several of smaller size side by side. These, while quite as efficient as a single large one, do not separate the edges of the wounds so much, and they can be afterwards withdrawn one after another, as the discharge becomes reduced." (*Lancet*, 27th March, 1875.) The situation of the tubes is of importance. They should be placed at the bottom of the wound and brought out at its most dependent angle, as shown in Fig. 5, where the drainage tube with its loops of silk are seen at the

lowest angle of the wound. This illustration also brings out how Mr. Lister's method of using the drainage tube differs from that of Chassaignac.

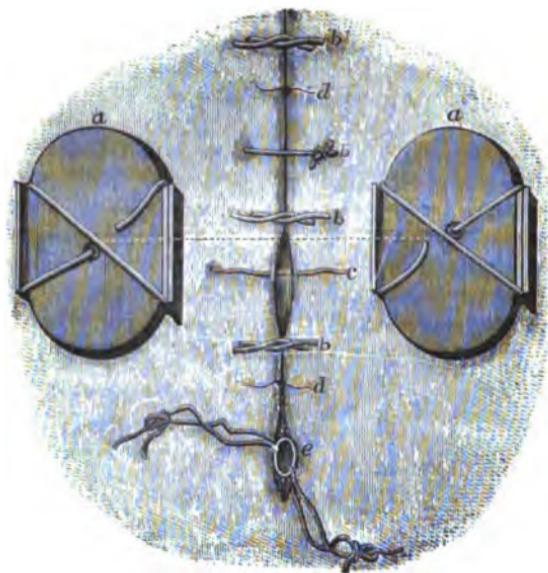


FIG. 5.

The best time for inserting the tube seems to be after the sutures have been introduced but before they have been tightened; and care should be taken that there is no bend on the tube, and that it is not compressed by any of the stitches. For introducing the tubes and putting them exactly in the position that we want them to occupy nothing is better than the accompanying forceps seen in Fig. 6. It is a modification of the ordinary dressing forceps introduced by Mr. Lister. He thus describes it in the *Lancet* of 3rd April, 1875:—"The blades, which are straight, are ground down to the size of a probe at their extremities, as shown in the accompanying sketch, so that they can be passed into a very small orifice. This instrument, which goes by the name of sinus-forceps among the Edinburgh instrument makers, will be found very useful for extracting small exfoliations and for various other purposes." In using it for the introduction of drainage tubes, it is passed into them in their long axis, either at one end or at one of the lateral openings, and in this way their entrance is very much facilitated. It is also useful in

making counter-openings, should that be necessary in any case, serving as a guide for the required incision. It can be obtained from Mr. Gardiner, 45 South Bridge, Edinburgh, at a cost of 4s. 6d., and I would strongly advise its being *nickelled*. Indeed, all surgical instruments should be, as they are thereby kept bright, clean, and free from rust, while any blood or dis-

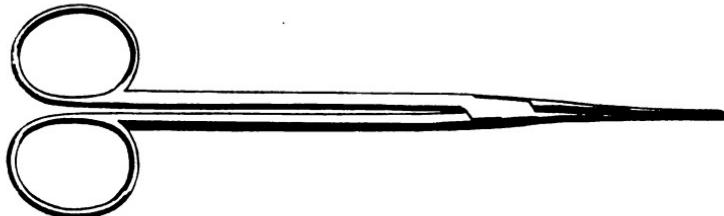


FIG. 6.

charges that may have dried on them are readily removed by washing with warm water. It is a real labour saving invention, to say nothing of the state of efficiency in which it keeps instruments and the protection it affords them. I find that Thomas Smith & Son, 25 Queen Street, Glasgow, nickel-plate surgical instruments at a very moderate charge.

Another point of importance is the proper time for removal of drainage tubes. Formerly, it was the practice to take them out and cleanse them the day after an operation, as of course they were filled with clotted blood, but Mr. Lister at present thinks it is not necessary to remove them to free them of this. He is rather of opinion that they should be left undisturbed for three or four days, as the blood clot shrinks and the serum finds its way out between it and the walls of the tube by capillarity. Further, the tissues around are consolidating and making a smooth passage for the tube, which makes its reintroduction easy when it is necessary to take it out. On the other hand, were it removed the day after an operation there might be some difficulty in getting it in again, and any blood clot that had formed would probably be broken down and washed away in fragments by the escaping serum. Of course, as the cavity of a wound or abscess contracts, any granulations that form tend to push the tube out, and then it must of necessity be lessened or replaced by a shorter and narrower one. Should there be several tubes in a wound the proper course would be to remove them one by one at intervals. Great care, however, must be exercised in not too hastily withdrawing the drains, and Mr. Lister's instructions on this point are, that "in abscesses

they must be employed till the cavity is completely closed," and that "when the wound is of any considerable depth they should be used as long as even trifling serous oozing continues." (*Lancet*, 27th March, 1875.)

There is one cause of obstruction in drainage tubes placed in a wound to which I have not yet alluded. It is especially common in spinal abscesses where the progress of the case is of necessity slow. I refer to the projection of fungoid granulations from the walls of the passage in which the tube lies through its lateral perforations. These block up the calibre of the tube and give rise to difficulty in extracting it and re-introducing it. This inconvenience is best got over by having holes in only the deeper part of the tube, as it is found that it is only near the integument that the granulations have a tendency to fungate. Very recently Mr. Lister has drawn attention to the necessity of manipulating the drainage tube in the line of the spray. Speaking at the late meeting of the British Medical Society at Cambridge, and alluding to a case of failure that had occurred under his care, he says:—"It occurred to Mr. Cheyne that, when they lifted out the drainage tube, they did not do so in the line of the spray; and, as there was a considerable volume of air which had not yet time to be acted upon by the antiseptic fluid, it might be that that was the cause of the mischief in this instance. He could not deny that that had been a matter he had overlooked. Mischief from this cause might be much more frequent than it had been, were it not that the holes in the drainage tube permitted the spray to get inside, and that the fluid matter at one end acted as a sort of piston in pushing out part of the enclosed air. He confessed that since he had used the drainage tube he had not got the same results that he had got with the old practice; and he suspected it was due to the use of the drainage tube in an imperfect way, and it might be, for, since he had used it in a more careful way, he had certainly got more perfect results. He commended it, at all events, to consideration." (*British Medical Journal*, 28th August, 1880.) While it has been found that for the general run of surgical cases the ordinary india-rubber tubes suffice, I believe that in carrying out antiseptic ovariotomies, the glass drainage tube, with a rim on it, introduced by Clay, of Manchester, is most in vogue, while for cases of empyema, treated by antiseptic incision, Mr. Lister has found that a metallic tube, with a metal collar on it, to prevent it slipping inside the chest, is preferable, because after a few days the ribs have a tendency to approximate and compress an india-rubber tube.

The metallic tube should be long enough to go thoroughly into the pleural cavity, and should be rounded at the end and have holes at the sides. I would only add that if it is necessary to use an ordinary drainage tube in a case of empyema, there should be introduced into each of the two loops of silk connected with its orifice, "a substantial mass of gauze (soaked, like the deepest pieces of loose gauze, in the carbolic lotion), to make sure that the tube is not sucked into the pleural cavity, as it might be, if there were only the silk thread applied to the skin." (*Lancet*, 20th December, 1879.) There is one other arrangement in connection with the subject of drainage to which I would refer, and that is *a combination of sponge and drainage tube*, which Mr. Lister has found very useful in certain cases, and his description of which is as follows:—"A sponge wrung out of a strong watery solution of carbolic acid (1 to 20) forms a very valuable aid to the drainage tube in preventing, during the first twenty-four hours, the accumulation of blood in wounds having a considerable cavity, such as those left after the removal of tumours. The wound having been stitched and the drainage tube (or tubes) inserted, a strip of oiled silk protective is laid along the line of incision to keep it moist, and so prevent the sponge from adhering. A soft sponge, large enough to cover the entire cavity of the wound, and purified as aforesaid, is then applied, and over it a gauze dressing, sufficiently extensive to reach several inches beyond the sponge in every direction. The whole is retained in position by a pretty firm bandage, so as to bring into play the elasticity of the sponge, which keeps the surfaces of the wound in apposition, and, while checking sanguineous effusion, compels that which does occur to escape by the drainage tube, when it is at once sucked up by the sponge as it oozes from beneath the protective." (*Lancet*, 3rd April, 1875). Lastly, as to the mode of rendering the tubes antiseptic. When they are new, this is accomplished by soaking them for a few moments in the 1 to 20 watery carbolic solution, but, if they have been used before (and there is really no objection to employ them over and over again for different cases), they should be placed for a couple of hours in the above solution. Should there happen to be any dried septic matter in them this will completely purify them. It is most convenient to keep the tubes in a wide mouthed bottle, filled with 1 to 20 carbolic lotion, and it saves time to have different sizes and lengths of them all ready threaded, so that a shorter one can be at any moment substituted for a longer one, if required.

(2.) *By Carbolised Catgut.*—I now come to the second

method of wound-drainage in use in Lister's system, that by drains of carbolised catgut. We owe its introduction to Mr. John Chiene, of Edinburgh, and his first published account of it is to be found in the *Edinburgh Medical Journal* for September, 1876. His reasons for bringing it forward cannot be better given than in his own words:—"Acknowledging the undoubted advantages of the drainage tube, as regards efficiency, I have long felt its disadvantages; for instance, its interference with rapid healing throughout the whole extent of the wound: the irritation it not unfrequently caused by its presence as a foreign body; the blackening of the protective, showing that irritating compounds were always present in the rubber, however pure; the tendency to regurgitation of air along the elastic tube during the dressing, thereby increasing the danger of mischief passing into the depths of wound; the necessity of dressing a case solely in order to shorten the tube; and the impossibility of being able properly to estimate the rate at which this should be done. These are self-evident evils, and their removal has for some time occupied my attention." (*Edinburgh Medical Journal*, September, 1876.) Bearing in mind that a drain need not be tubular to be efficient (as shown by the old custom of bringing the silk ligatures out at the corners of a wound, and by the india-rubber threads which Chassaignac used), and struck by the fact which the late Mr. Callander of London communicated to him that he employed catgut to stitch the drainage-tubes to the deepest part of wounds to keep them in position for the first three or four days, after which the catgut became absorbed and the tubing was gradually removed, the idea occurred to Mr. Chiene that it would be a good plan to make the entire drain of catgut instead of caoutchouc, for, if efficient, its advantages in being absorbable were apparent. The experiment was tried both by himself and afterwards by Mr. Lister, skeins of carbolised catgut being passed through the cavity of wounds before stitching them up. It was found that, of course, in a few days they were absorbed; but previous to that they acted admirably, their action being due partly to capillarity and partly to their acting as a lead to the discharges. Mr. Lister thus alludes to this innovation:—"Mr. Chiene, of Edinburgh, suggested some time ago the employment of catgut as a substitute for the caoutchouc tube. He hoped by this means to provide adequate drainage through capillary attraction, and, at the same time, by virtue of the proneness of catgut to absorption, to do away with the necessity for the withdrawal of the drain from time to time, which there is

when the caoutchouc tube is used, whether for the purpose of shortening the tube or substituting a small one for a large. Mr. Chiene's anticipations were to a considerable extent realised. In all cases in which the wound remained aseptic, the absorption of the deeper part of the catgut drain, and consequent falling off of the part outside the wound, might be reckoned on as a matter of course; and in several cases in which the catgut was so used, both by Mr. Chiene and afterwards by myself, the drainage proved adequate and satisfactory." (*Lancet*, 5th January, 1875). The catgut used for the drains is the same as that employed for ligatures, a description of which has already been given in a previous paper. The drains are made by taking eight or twelve ply of gut, varying in length according to the nature of the wound, and tying them lightly in the centre with another piece of gut, just as a sheaf of corn is bound by the reapers. Any thickness of gut may be used, but the thin variety seems the best. The drains may be kept of different lengths, all ready prepared, and should be immersed in 1 to 5 carbolic oil. The mode of using the catgut drain varies, but depends a good deal on the peculiarities of each case. (1.) It may be placed in the deepest part of a wound, stitched there with gut to prevent its rising, and its free ends brought out at the extremities of the incision. (2.) The threads of the drain may be separated into two or three portions, which are brought out at intervals between the stitches. (3.) In extensive operation wounds, drains and tubes may be combined. (4.) Tubes may be used for the first few days, and afterwards catgut drains, so as not to necessitate looking at the wound until it is healed. Whichever of the above methods is employed, it is found that in a few days, the number varying with the number of the catgut threads employed, the drain is absorbed and healing has gone on satisfactorily. Admirable as Mr. Chiene's suggestion has proved to be, further practical experience of it has shown that it, too, has some disadvantages, and no one is more ready than he to admit that its use requires considerable care and discrimination. No doubt, it saves the dressing materials, as it does away with frequent changings of the dressings, but it has, as I said, some drawbacks, to which I will refer after I have spoken on the subject of horse hair drains, which act on the same principle as the catgut, and are now a good deal used in Lister's system.

(3.) *By Carbolised Horse Hair.*—It was Mr. White, surgeon to the General Hospital at Nottingham, who first brought horse hair as a drain to the notice of the profession, and his

reasons for so doing are given in the following quotation from the letter to the *Lancet* of his house surgeon, Dr. Marshall :— “Lister’s method is used in its entirety here, and the carbolised catgut drain, as recommended by Mr. Chiene of Edinburgh, had been adopted ; but, from the increased cost incurred by its use, horse hair has lately been substituted for it. Catgut is superior to horse hair on account of its being capable of absorption ; but the capillarity of horse hair, from the increased number of threads, is greater. Horse hair is preferable to india-rubber drainage tube, because of its unirritating properties and freedom from any ingredient calculated to impede the healing process.” (*Lancet*, 2nd. Dec., 1876.) Black horse hair is preferable for the drains, which are made just as those of catgut by taking a number of threads, cutting them a certain length, and binding them lightly in the centre with another thread to hold them together. They are introduced much in the same way as the catgut ones, and the modes of employing these latter, enumerated above, apply equally to the horse hair ones. Should it be necessary in the progress of a case to re-introduce a horse hair drain, it is readily done, as Mr. Lister points out, “by taking a wisp of hair of half the thickness required, bending it in the middle at a sharp angle over a probe, and tying a piece of carbolised silk round it close to the probe, on withdrawal of which the drain is left with a rounded end, which passes readily into the interior of the wound.” (*Lancet*, 5th Jan., 1878). As in the case of sutures, horse hair drains may be rendered antiseptic by a short immersion in 1 to 20 carbolic lotion, but it is best to keep a number of them of various lengths, ready prepared, soaking in some of that solution.

Seeing then that catgut and horse hair resemble one another in the principle by which they act as drains, what are their respective merits ? Owing to the length of this paper I can only go into this question briefly, and must state a number of facts which experience has brought out rather than arguments, so that my readers must judge for themselves. (1.) Catgut is no doubt a non-irritating material, and instead of interfering with healing rather aids it by serving as pabulum for the tissues. (2.) Owing to its absorption by the living walls of the canal in which it lies, it lessens the number of dressings, and consequently the expense. (3.) It is best suited for those cases where a speedy cure is probable, on account of its rapid absorption. (4.) It is not applicable to cases where there is likely to be any suppuration, as it cannot drain away pus, though it readily does serum. (5.) It is much more expensive than horse hair. As Mr. Lister says, “whereas the prepared

catgut is a somewhat expensive article, a horse's tail is a very cheap one." (*Lancet*, 5th January, 1878). (6.) Horse hair can be used in cases where the catgut would probably be absorbed before the necessity for drainage had passed away. (7.) Conversely, as pointed out by Mr. Lister, horse hair "can be not only reduced in bulk, but withdrawn altogether at an earlier period than is required for the absorption of the catgut; for the catgut, in process of organisation and absorption, becomes more or less incorporated with surrounding tissues, through the medium of the cells of new formation which invade it, and if an attempt is made to withdraw the drain in whole or in part, there will often occur inconvenient oozing of blood through the rupture of newly formed vessels. And if, on the other hand, the drain is left intact till the parts of the catgut within the wound are entirely absorbed, there remains a small granulating sore at the place of exit of the drain, which may retard for some days the complete healing of the wound." (*Lancet*, 5th January, 1878). (8.) The threads of the catgut soon swell after introduction, from their being filled with the new cell growth connected with their absorption and organisation. This somewhat interferes with effective drainage. Horse hair, on the other hand, lies unchanged among the tissues, and acts as well after a lapse of some days as at the first. (9.) Horse hair drains have been found very suitable in cases where a tube would not have acted, as in excision of the knee and in the operation for transverse fracture of the patella, in both of which cases a tube would probably have been obliterated by pressure from the adjoining bones and tissues. (10.) Horse hair drains act as well when they have become bent in a wound as when they lie quite straight. (11.) Horse hair, no matter how long it remains in a wound, never contracts the unpleasant odour which very often clings to the india-rubber drainage tubes in the best aseptic cases.

From the above it will be seen that, while the catgut drain is an admirable invention and really paved the way for the horse-hair one, which acts on the same principle, yet the latter substance has qualities that give it a superiority over the former, and thus it is that Mr. Lister seems to have a preference for it. Indeed, its behaviour in some cases was so satisfactory that he tells us that, at one time, he had employed it in all wounds in preference to the tubes, but at present he still uses the latter in severe operations and wounds of considerable size. And this is what every surgeon must do. He must consider each case on its own merits,

and select for it the method of drainage that seems most applicable, be it tubes, catgut, or horse-hair, only let him see that his drainage is both sufficient and efficient. I know that other substances have been used as drains without interfering with the main principles of Lister's system, such as strips of protective india-rubber threads, decalcified bone drains, and so on, but into a discussion of these I cannot go. To recapitulate, then, in conclusion, I would direct attention to the following points:—

- (1.) Sponges are used in the conduct of operations carried out antiseptically.
- (2.) New sponges, after being rendered soft by the removal of sand and other impurities, are rendered antiseptic by soaking in 1 to 20 carbolic lotion.
- (3.) After being used, sponges can be cleaned by soaking in water or muriatic acid and water, and are then rendered fit for further use by immersion in 1 to 20 carbolic lotion.
- (4.) During an operation great care should be taken that the sponges are not placed carelessly about, so as to become a source of danger to the wound by introducing septic particles.
- (5.) Drainage is effected in Lister's system by (a) Chassaignac's tubes, (b) drains of catgut, or (c) drains of horse-hair.
- (6.) The Chassaignac's tubes should have lateral perforations and two loops of carbolised silk at the outer end to keep them in position.
- (7.) This outer end should be cut oblique or transverse according to the case, and *it should be flush with the skin*, as any portion of the tube which projects is compressed by the dressing, and the discharge cannot make its way out.
- (8.) When tubes are withdrawn from a wound for any purpose, they should be manipulated always in the line of the spray.
- (9.) It is best to leave tubes undisturbed in a wound for three or four days after an operation, as there may be difficulty in re-inserting them.
- (10.) Considerable care must be exercised in not too hastily or prematurely giving up the use of the tubes in a wound.
- (11.) Catgut drains, owing to their being absorbed, are useful in cases where drainage is needed only for a short time and where rapid healing is likely to ensue.
- (12.) Horse-hair drains, which act like the catgut ones, by capillarity, are in some respects more efficient and are of very general applicability.

(To be Continued.)

A CASE OF HYDROPHOBIA.

By ANTONY MILROY, F.F.P.S.G., Kilwinning.

ON the evening of Friday, the 17th December last, John Waterson, aged 14½ years, a collier, residing at Viaduct Row, near Kilwinning, was bitten on the hand by a dog. The boy had been attempting to stroke its head when the dog suddenly seized him by the right hand. I was immediately sent for, and about an hour after the accident occurred the wounds were thoroughly cauterised with nitrate of silver and ordered to be poulticed. Before I saw the boy the wounds had bled very freely. The bite in the palm of the hand was at the root of the ring finger, about three quarters of an inch in length, and went down to the bone. There were three small punctured wounds on the knuckle of the same finger. The boy was confined to the house for nearly a week, warm poultices were regularly applied and the arm supported in a sling. When the wounds were clean and healthy like, the poultices were stopped, and an ointment made of lard and carbolic acid was used for dressing them. At the end of a month the wounds were all healed without almost any suppuration, when the boy returned to his work, at which he continued for nearly a fortnight without any bad symptoms; but on the evening of Friday, the 30th January, 44 days from the time he was bitten, he was seized with purging and vomiting.

Saturday, 31st January.—He was so much better that I was not called in to see him, although within a few yards of his house; but in the evening he was again attacked with purging and vomiting, which lasted the whole night.

Sunday, 1st February.—He was again better, but during the afternoon I received a note asking me to visit him, as his parents were afraid he might become worse during the night. I saw him in the evening about six o'clock, 48 hours after his illness commenced, and found the following symptoms. A hot burning skin; tongue clean and moist; pulse 84; pain over the bowels; vomiting had stopped since the previous night; the cicatrix of the bite in the palm of the hand was slightly painful on pressure and red; there was also slight pain in the axilla. He said he had been working very hard and thought that he had hurt his hand with the pick shaft. I prescribed one grain of opium, and advised his hand to be poulticed.

Monday, 2nd February, 10 A.M.—He felt very much better. Skin moist; pulse 80. Tongue moist; redness of hand and pain in axilla gone. He had vomited a worm during the

night, and now thought that he had got rid of his complaint. Felt very thirsty. I prescribed a mixture containing bromide of potassium, to be administered in dram glass doses every hour. He had taken two such doses without any difficulty, but when the third dose was being administered, about four o'clock in the afternoon, he felt difficulty in swallowing, and immediately vomited. After this he became worse, blamed the mixture, and refused to take any more of it. Vomiting continued at intervals during the night, and although he felt very thirsty he would take no water, as he believed it sickened him. As yet he had no reliable symptoms of hydrophobia.

Tuesday, 3rd February, 10 A.M.—When I entered the house I found the boy in a terrible convulsion. The mother told me that if I would wait for a few minutes he would come out of the "weak turn," as he had taken one or two during the night. He rallied in about a minute, blamed the mixture, and said he could not now bear the sight of water or any vessel containing it. He told me that he had had a bad night's vomiting and sweating, that within the last half hour he had a sort of "itchy, jaggy feeling" about the throat, which he thought was due to worms, and which he was sure "he would soon get up." His pulse was 84, perfectly natural in character; but the heart was labouring terribly, as its action could be seen and felt over the whole of the chest and abdomen. The soft regular pulse with the labouring heart struck me as very peculiar. His tongue was quite moist. As yet there was no expectoration. His vision was perfect, but the pupils were very much dilated, the left one was quite inert, the right one still contracted when the light of a candle was held before it. His respirations were about 20 per minute, and resembled those of a hysterical patient after a sudden douche of cold water. The muscles of the throat were in constant motion. I asked him to take a drink of milk, but he objected, saying it would be sure to make him vomit. I held it before him, and insisted upon his swallowing one teaspoonful, when he at once went into suffocative convulsions and tumbled over in bed. When he had rallied from the convulsions, I again held it before him, and insisted on his swallowing it. He drew back from it in terror, and fixing his wild glistening eyes upon it looked at it fiercely; for a moment he halted as if summoning up all his courage, when suddenly he clutched the spoon and in desperation carried the milk to his mouth and swallowed it; but it was no sooner over than he commenced to vomit. I advised his mother to put 10 grs. of bromide of potash into his mouth every two

hours. This, I afterwards learned, he would not allow lest he should be suffocated. I now saw that I had a genuine case of hydrophobia to deal with, and at once sent for assistance from other medical gentlemen.

4 p.m.—Saw him in company with Dr. Wilson, Irvine. Pulse 100. Heart not labouring quite so much. Temperature $102\frac{1}{2}$. Eyes now very brilliant. Left pupil does not act. Right pupil still acts, but very sluggish. Spitting a frothy mucus at the rate of four expectorations per minute. Slightly pained over the bowels. Dr. Wilson asked him to sit up in bed and attempt to swallow a little milk, the mentioning of which at once put him into suffocative convulsions. He now cried constantly for the door to be kept shut, and seemed to have even a greater horror of an open door than the water. Dr. Wilson quietly opened the door, which at once caused the patient to tumble right over in bed, and sent him into the most violent convulsions, when he roared and howled not unlike a dog. His respirations were still of the same panting character, but the "itchy jaggy" feeling in the throat had given way to one of threatened suffocation. He was still perfectly sensible, and strongly objected to medicine in any shape whatever. To approach him or breathe upon him was sufficient to bring on an attack of threatened suffocation.

9 p.m.—Saw him in company with Drs. Craig, Pringle, and Wilson. Pulse 120. Temperature 106° . Respirations, or rather pantings, 30 per minute. Both pupils now completely insensible to light, and very much dilated. Expectorations very rapid, about one in every three seconds. A clear watery fluid running freely from the nostrils. His senses seemed to be very much more blunted than at four o'clock, as he could now look at water being poured from one vessel to another without going into convulsions, but if he attempted to swallow fluids he at once commenced to vomit a dark greenish-coloured matter, and his constant cry was "keep the door shut," which at times he imagined he saw open. Dr. Craig suggested that large doses of chloral hydrate should be given by the rectum, and although the other medical gentlemen were more inclined for morphia hypodermically, we thought proper to yield to Dr. Craig's experience of more than half a century.

Wednesday, 4th February, 9 a.m.—Pulseless. Heart's action could not be felt by the hand. He recognised me for a moment when roused up, but if let alone he continued in a state of low muttering delirium. Temperature 107° in the rectum. Whole body livid. Pupils very much dilated, and conjunctivæ injected. Left eye ball turned inwards. No motion in trunk

of body, but the legs and muscles of the neck in constant motion. Breathing still consists of short pants. He now lies on his back, which he could not do previously. The "hydrophobic slaver" now decreasing, as the expectorations are about three per minute, but a very copious discharge still continues to run from his nostrils. Lower jaw slightly paralysed. His tongue is livid in colour, and protrudes slightly from his mouth. I found that he had only got 60 grains of chloral by the rectum, as he would not allow any more to be administered, and struggled hard if any one approached him to do it. He died about half-an-hour afterwards, having lived 110 hours after he was seized with vomiting, and about 30 hours after he showed unmistakable symptoms of hydrophobia.

Remarks.—I am of opinion from what I have seen in this case that real hydrophobia cannot be cured any more than small-pox. Cases of recovery have been recorded, but I can hardly think these belonged to the undoubted virulent type. The mortality of the present day, with all our stores of therapeutics, is as great as when the doctors caused the patient to eat the roasted liver of the rabid animal. I can hardly imagine a constitution, with all the assistance of medicine, strong enough to wear out so dreadful a virus; but I hope physiology and pathology will yet be able to show us something else than the black drop of death in the cup of so horrible a malady.

A CASE OF IMPERFORATE HYMEN.

BY JOHN GLAISTER, M.B., L.R.C.P. & S. ED.,
Fellow of the Obstetrical Society of Edinburgh, &c.

MY only excuse for bringing this case before the readers of the *Glasgow Medical Journal* is that cases of the above are comparatively rare, and that writers disagree as to the mode of treatment.

At the Cambridge meeting of the British Medical Association, this subject was incidentally brought up in the course of a discussion on a paper by Dr. Matthews Duncan of London, on "Open Fallopian Tubes;" and there were differences of opinion as to whether there should be a free opening made in the hymen, and as much of the retained material evacuated as possible, or a small opening made, with a gradual withdrawing of the contents. Drs. Matthews Duncan and Marion Sims

advocated the former method, and Dr. Byrne, of Dublin, the latter. Dr. Emmet, of New York, also advocates a free opening and immediate evacuation. Death has taken place after opening of the hymen, from putrefaction setting up in the uterine contents, after both ways. The facts of the case which I wish to lay before the reader are these:—

Nelly B., aged 15, on the 3rd of March last year, complained of great pain in the abdomen, difficulty of micturition, and defæcation. Her pulse was quiet, firm, and regular, 84; temperature normal. I had been consulted by her several months previously, and she then complained of headache, abdominal pains, and general malaise, but soon recovered under the influence of gentle purgatives and a tonic regimen. On the present occasion, I was struck with the alteration in her countenance, which, instead of being girlish, had developed a womanly appearance. There had been suspicion of impending menstrual function at the former period, and on my now enquiring, I found that she had never been "unwell." I proceeded to examine the abdomen, and found it distinctly elevated, more particularly in the middle line. Percussion was tympanitic all over, except in middle line, and an area on each side of that, from a point one inch below umbilicus to the pubes; palpation revealed a rounded tumour, the outline of which could be traced.

Besides the foregoing symptoms, she complained of pain in the back and groins, headache, bearing-down feeling, and general uneasiness.

Her breasts were developed, and there were darkened areolæ round the nipples.

These symptoms led me to suspect some retention of the menstrual fluid, probably from obstruction somewhere, to elucidate which further examination was necessary.

Examination of genital organs showed that the hymen was complete, not a vestige of an opening in it, and was bulging out convexly between the labia minora. On introducing my finger into the rectum, I found a tumour intruding itself into the rectal space, having the feeling of fluctuation in it; the diagnosis was then perfectly obvious.

On explaining to the mother of the girl the nature of the case, she, seeing the girl's sufferings, agreed with me in thinking that something should be done for her relief.

Patient being then put in the lithotomy position, I plunged a grooved needle through the hymen, and had the satisfaction of seeing an exudation of dark treacly fluid, characteristic of retained blood and mucus, passing along the needle track. I

then introduced a pair of forceps along the needle, and forcibly extended its limbs, when the flow of fluid increased; I then incised the membrane freely with a bistoury, when the fluid came freely forth in the manner treacle does from a stop-cock. I next introduced my two forefingers into the bistoury wound, and forcibly tore open the remainder of the membrane, which was a thick one, in order to avoid the possibility of troublesome haemorrhage, by tearing the vessels. The grumous-looking treacly material then flowed freely. While the liquid flowed, I kept my hand on the abdominal tumour, and felt it gradually decrease in size, which I then firmly grasped in the manner one does for the expulsion of a placenta, and so assisted the uterus to empty itself of its now dangerous contents.

I am sorry that I did not accurately measure the quantity of discharge, but the mother of the girl, and a female friend who was present, both agree with me in saying that there would approximately be from 2 to $2\frac{1}{2}$ pints. The patient voluntarily said that she felt all right now; her pains were gone; she felt easy.

While the flow of fluid was declining, I placed over the vulva a cloth rung out of a 1 to 40 solution of carbolic acid; she was then allowed to rest a little, when I syringed out the now open vaginal cavity with a 1 to 50 solution of carbolic acid. Carbolic gauze was now placed over the vulva, and a 3ss dose of liquid extract of ergot given; warm poultices were ordered to be applied to the abdomen, and warm drinks administered.

In the evening, I found that she had slept well, and that some discharge had flowed into the gauze.

The pulse was 84; temperature normal. No pain was experienced on firm pressure over the abdomen.

Another 3ss dose of ergot was administered; to continue poultices and carbolic acid solution cloths. The vaginal douche was again freely used.

4th March.—Patient had slept well, but pain was complained of in lower part of the abdomen, probably due to the action of the ergot. Discharge was very moderate in quantity, lighter in colour than formerly, having no smell. Pulse 84; temperature 99.5°. Vaginal douche again used, but instead of carbolic acid, used a mixture of Condy's fluid with water (3ss to the quart), which brought away a little grumous material. Carbolic acid cloths to be still applied. Her diet at this time consisted chiefly of spiced milk (as she was much troubled with flatulence), arrowroot, gruels, and beef tea.

Evening temperature was 98·7°; pulse 80. Aperient medicine given in the morning had freely acted, and had relieved her of her flatulence. No pain on pressure over abdomen.

5th March.—Douche used as before; no pain; sleeps and eats well; pulse 84; temperature 98·8°.

6th March.—Complained of pain after injection last night, but this left shortly afterwards; no pain now.

Not to be tedious, I merely remark that the temperature afterwards was never higher than 98·7°.

About the 9th, the wound in the hymen threatened to unite considerably, and to obviate that, I introduced an ebony drainage tube of good sized calibre, but it was removed on the 11th because of the pain it occasioned, and a plug of lint dipped in carbolic solution was substituted. This was introduced daily until the 2nd of April, when menstruation, of moderate quantity, and lasting for four days, appeared.

She again menstruated with no uneasiness on the 9th of May, showing the continued patency of the passage.

Her subsequent history up till the present time is simply that she continued to menstruate regularly and painlessly, and that a few months ago she was married.

Remarks.—The free opening made in the hymen, and the evacuation immediately of the retained menses, with the ease which immediately resulted, seem to me to point to the method of treatment to be adopted in these cases, there being less risk of putrefaction setting up after complete evacuation, than after gradual withdrawal, at stated intervals, of the retained fluid.

The complete absence of fever and pain throughout the whole case (indicative of putrefactive changes generally after this operation) point to the entire absence of these changes, and render the operation and after treatment a comparatively easy matter.

AN EXAGGERATED CASE OF LUPUS EXEDENS.

By ROBERT MUNRO, M.A., M.D., Kilmarnock.

THE following particulars regarding a case of lupus exedens, of about 18 years' standing, appear to me of sufficient interest to bring them under the notice of the profession, inasmuch as they bear on the natural history of the disease, especially its persistency and obstinacy under treatment, and the great deformity it produces on the face when its ravages are unchecked.

History.—The unfortunate sufferer in this case is 53 years of age, and the wife of a respectable working man. She was married at the age of 21 years, and had five children before she became affected with this disease, and six subsequently. The concurrent testimony of all her early acquaintances goes to show that she was an uncommonly good looking woman, of a rosy complexion, with light reddish hair, and (what is rather singular) dark brown eyes. Soon after the birth of her third child she suffered from ulceration of the throat, which, she says, never got perfectly well till the left ala of the nose became diseased some two or three years later. She states that it was the opinion of the doctor who attended her that the disease came down her nostril. The late Dr. Aitken treated her for some years with various internal remedies, together with frequent and severe applications of caustics externally. When I saw the patient first, about 10 years ago, she had made up her mind that her disease was incurable. Shortly after this I met with another case of lupus of 7 years' standing, which was successfully treated by large doses of iodide of potassium along with the external application of acid nitrate of mercury, a report of which I published in the *Lancet* for 19th October, 1872; but, notwithstanding all my representations, I could not induce her to submit to this or any other treatment. Since then the disease has gradually crept over the whole face and anterior portion of the neck down to the clavicles, but now it appears to have exhausted itself, as there are no traces of unhealthy tissue anywhere, except one or two small crusts over a portion of the scalp, a few inches above the forehead.

Present condition.—But of this once beautiful face what now remains? A hideous wreck, without form or comeliness, and utterly devoid of human expression. After a time, and as the disease progressed circumferentially, central cicatrization occurred and gradually, as it were, overtook the disease, till it now forms a complete and uniform mask over the face and anterior portion of the neck. This cicatricial covering is smooth and of a whitish glistening appearance, similar to that of a deep burn, but contains not a single aperture except a round hole about an inch in diameter, which forms the orifice of the mouth. Not a trace is to be seen of either lips, eyelids, eyebrows, nostrils, or nasal prominence. The position of the eyes is only distinguished by the motion of the eyeballs, which are readily observed to roll under the tough cicatrix. Through this false skin she can distinguish day from night, and the sudden change from darkness into gas light. Her general health is fairly good.

CASE OF RECOVERY FROM HANGING, WITH
REMARKS.

By JOHN TAYLOR, M.D., Edinburgh.

ON 16th February, 1880, at 11:35 P.M., Mr. S., Leith Walk, summoned me to his wife's assistance. He had, he said, just cut her down from the kitchen door, over which, in his absence, she had hung herself with the clothes' rope, and he had, with the aid of a female neighbour, managed to lift her on to the bed.

On entering the house, which is close by my own, I found the patient, a stout and heavy woman, 44 years of age, lying comatose on her bed. The mouth was surrounded by much white froth, with a swollen tongue protruding from it, the face, moreover, was bloated and dusky, the lips were dark blue, and the neck was marked of a brown parchment colour, with abraded epidermis at the level of the larynx.

The conjunctivæ were insensible to the touch, the pupils dilated, and the retina also appeared to be paralysed, as no contractile response was given by the iris on the approximation of a burning taper. Loud shouting into the patient's ears elicited no reply, the fingers were clenched, while the limbs hung helplessly, owing to a flaccid condition of her whole muscular system. Reflex action, as tested by tickling the soles of the feet, was found quite in abeyance.

The chest walls were next laid bare, but the hand applied to them could not detect any respiratory movements whatever. On very careful palpation in the cardiac area, however, a faint beating at the apex was recognised, and there was also a fine thready pulse detectable in the radials.

I saw that there still existed some lingering vitality in the citadel of life, although the lungs and brain were practically dead, owing to stagnation of the blood in their respective veins.

The mode of treatment, therefore, to be adopted by me, became at once apparent, to wit—try, by artificial respiration, to establish the suction action of the lungs, by which mechanism the venous blood is naturally drawn from the cervical and cerebral veins into the right side of the heart.

Having elevated the thorax and thrown the head and neck well back by placing pillows under her shoulders, I seized the tongue with my artery forceps, and while retaining it well out of the mouth, instructed and guided two female friends, each having an arm of my patient, to act synchronously in their

endeavours to perform Sylvester's method of artificial respiration.

With the exception of causing the husband to apply warm water bottles to the soles of the feet, and to rub the legs with hot flannels, I continued to practise as above till 1 A.M., when Dr. Littlejohn, whose help I had requested, arrived. He strongly urged me to persevere in the endeavours, saying, however, that in an experience of 25 years as Health Officer, although there had been several cases of hanging, yet it was the first in which recovery seemed possible. At 1:30 A.M. we were gratified to find a slight muscular movement spontaneously commencing in her legs. By 2 A.M. the conjunctiva became sensible to the touch, in another half-hour there was a tendency to retching manifested, and consequently hopes were inspired of returning consciousness; these efforts of nature I endeavoured to encourage by firm pressure on, and frequent squeezing and kneading at the pit of the stomach.

At 3 A.M. free vomiting became established, and I turned the patient on her side to assist the expulsion of the food and prevent any entering her half sensitive larynx. The artificial respiration, however, required to be continued till 4 A.M., by which time her recovery was so certain, that I left her to the management of the friends. I called again at 8 A.M., and found her asleep; the friends said she had not appeared able to address any of them, but on arousing her I was readily recognised, only she appeared astonished at my visit, not remembering anything at all concerning the previous night, but simply complaining of an intense headache. I ordered a leech to each temple and a few doses of jalap powder.

Next day I found her headache easier, and in three days more she was sufficiently restored to resume the more simple parts of household duties, and her future progress was rapid and complete.

The woman appears to have been driven to this rash and suicidal act by the habitually abusive and intemperate character of her husband, but how long she hung over the door I am not able to say, as she was alone in her house most of that evening, and her memory of the occurrence is a total blank. The husband, however, assures me that she was in the position of resting the knees on the floor when he cut the halter. The mode of arrangement of the rope was that of first tying it to the handle of the door, and then bringing the rope over the top, and suspending herself in a noose on the opposite side.

Remarks.—From finding on reference to works on medical jurisprudence that only one or two examples of recovery from

hanging are recorded, and that most of the patients succumbed next day, I have thought it expedient to record this example. I may also be permitted to point out the class of cases to which alone I consider treatment applicable. Deaths by hanging may conveniently be divided into three groups, according to the rapidity with which the fatal event is developed, and this latter issue is apparently, as far as swiftness of fatality is concerned, determined by the organ in which death primarily sets in. The first group includes those sudden deaths, exemplified in judicial and homicidal cases, in which the cardiac systole is arrested from syncope, the result of fright, or in which the "drop," by causing luxation of the upper cervical vertebra or fracture of the odontoid process, at once destroys the origin of the respiratory nerves. The next group embraces those slower deaths by apnea, in which the ligature has been fastened at the lower part of the neck over a resilient trachea, or in which the mechanical tightening of the cord has been effected under the lower jaw by the weight of the victim in the "drop," in this manner producing an efficient compression of both the air tube and of the carotid arteries. In these cases death ensues mostly by apnea, because this process is capable of consummation somewhat faster than that of apoplexy. The last group consists of those slow deaths, of which Mrs. S. was an incipient example, in which there is no "drop" to tighten the halter, because the subject chooses his bed post or bed-room door as his scaffold, and in which, moreover, the cord is tied over a resisting and ossified larynx, and in the male, often including the beard in its noose, thus further assisting the diffusion of the pressure and allowing a sufficiency of air to enter the lungs to postpone death by apnea, but at the same time effecting sufficient obstruction to the continuance of cerebral circulation to establish a crescent apoplexy. This last group appears to me to contain the cases in which alone timely treatment by determined and lasting endeavours at resuscitation is likely to be occasionally rewarded by a recovery.

CURRENT TOPICS.

MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.—At the first meeting of the session, held on the 1st October, the following office-bearers were elected. *President*—Dr. Geo. Buchanan.

Vice-Presidents—Dr. D. Taylor, Paisley, and Dr. J. B. Russell. *Council*—Drs. Alex. Robertson; A. L. Kelly; Bruce Goff, Bothwell; Geo. Willis, Baillieston; Geo. Mather; H. C. Cameron; R. W. Forrest; T. Lapraik. *Treasurer*—Dr. Hugh Thomson. *Secretaries*—Dr. Joseph Coats and Dr. W. L. Reid.

GLASGOW SOUTHERN MEDICAL SOCIETY.—At the thirty-seventh annual meeting of this Society, held on the evening of the 7th October, the following office-bearers for the session 1880-81 were appointed:—*President*—T. F. Gilmour, L.R.C.P. Ed. *Vice-President*—Neil Carmichael, M.D. *Treasurer*—E. M'Millan, L.R.C.S. Ed. *Secretary*—William Carr, M.B. *Editorial Secretary*—Wm. M'Farlane, M.D. *Seal Keeper*—Alex. Napier, M.D. *Court Medical*—John Niven, L.F.P.S.G. (Convener); A. L. Kelly, M.D.; Eben. Duncan, M.D.; James Stirton, M.D.; Robert Park, L.F.P.S.G. The following gentlemen, with the office-bearers, form the Council:—A. J. Hall, M.D.; Archibald Pearson, M.D.; Wm. Wilson, L.R.C.S. Ed.

WESTERN INFIRMARY APPOINTMENT.—We understand that the directors have appointed Dr. Murdoch Cameron, Windsor Terrace—for several years acting physician to the University Lying-in Hospital—to be one of the physicians-accoucheur to the Western Infirmary.

ASSOCIATION OF SURGEONS PRACTISING DENTAL SURGERY, 11 Chandos Street, Cavendish Square, W.—The meetings of the present session will take place on the following Wednesdays, at 8:30 o'clock P.M.:—1880—17th November, 15th December. 1881—26th January (General Meeting for the election of officers and council), 16th February, 16th March, 20th April, 18th May.

REVIEWS.

Lessons in Gynecology. By WILLIAM GOODELL, A.M., M.D., Professor of Clinical Gynecology in the University of Pennsylvania. Pp. 454. London: Baillière, Tindall, & Cox. 1880.

THIS book, like most others of its kind, opens with two chapters on gynaecological instruments and methods of examination, which in this case are clear and good. In speaking of exam-

ination by the sound, Dr. Goodell refers to its danger in pregnancy, and gives the following as a good "off-hand" rule:— "When the cervix is as soft as one's lips, the woman is probably pregnant; when it is as hard as the tip of one's nose, the womb is most likely empty." The author speaks very strongly, and, we think, very truly about the use of Fergusson's speculum. "From its mirrored sides, this glass speculum possesses the great advantage of throwing more light on the cervix than does any other speculum, and, for that reason, is excellent for the examination and treatment of patients at their own homes, which are often dark. On the other hand, from its length and narrowness, and from the distortion of the parts which it causes, it is the very worst speculum possible for diagnostic purposes, and has probably done more to retard the advance of gynecology than any other cause. When, however, by the bivalve or duck-bill speculum a diagnosis has been made, the largest and shortest possible glass one will often be found a convenience, if not a necessity."

In connection with the operation for vesico-vaginal fistula, very careful details are given, and the rare forms of fistula called uretero-vaginal and uretero-uterine are described, and treatment which had been successfully employed is given. Where the urethra has been destroyed, and transverse obliteration of the vagina is consequently out of the question, complete closure of the vulva is recommended, after having some weeks previously made a permanent opening from the vagina into the rectum. Two cases are given where this had been done with excellent results. The rectum soon gets educated to retain the urine for at least some hours.

Our author waxes eloquent on the subject of the causes and prevention of laceration of the perineum. Speaking about support of the perineum in labour he says, "One advocates pressure on the perineum with a folded napkin; another with an unfolded napkin; a third scouts all napkins, whether folded or unfolded. One plugs up the rectum; another empties it. The perineum is pushed forward by some, and backward by others. Some place their hand transversely across the perineum; some longitudinally, with the fingers looking upward; some longitudinally, with the fingers looking downward. As runs our nursery rhyme: 'Simon says, "thumbs up!" Simon says, "thumbs down!"' and yet the perineum tears, and tear it will, until woman becomes—like the cherubs of the old masters—all wings and no body." According to his view the causes are, "1st. Rigidity, dryness and congestion of the soft parts, as in first labours. 2nd. Absolute or relative dis-

proportion between the size of the head or of the shoulders and that of the vulva. This also includes the presence of one forearm, or both, along with the shoulders. 3rd. Every cause, whether moral, anatomical, or physiological, that precipitates the passage of the head through the soft parts—as, for instance, violent straining efforts through great nervous excitement, a small head, a straight sacrum, or an overdose of ergot. 4th. Faulty mechanism of labour, such as incomplete flexion or incomplete extension of the head; or an occiput rotating posteriorly. 5th. Keeping the limbs straight and in close contact at the moment of the birth of the head. 6th. Causes dependant on the physician, such as the abuse of the forceps, a faulty method of supporting the perineum, and meddlesome midwifery."

His own practice is, as a rule, to do nothing except to retard the passage of the head through the vaginal orifice by pressure on its crown. If, however, the perineum is very rigid, he says, "I relax it, by hooking up and pulling forward the sphincter ani, with two fingers passed into the rectum, while with the thumb of the same hand I make the needful restraining pressure upon the head."

There are some valuable observations in regard to the part played by the forceps in causing and avoiding rupture of the perineum. "At best, by the use of the forceps the head is liable to be brought down too fast upon undilated soft parts, and to be prematurely delivered. To tell you the truth, such grave lesions to the mother, and, for the matter of that, to the child also, from the use of the forceps, are so constantly brought to my attention, that I am disposed to accept Baudelocque's dictum, that, take it for all, 'The forceps have been more injurious than useful to society.' My advice, therefore, to you—and you will find it a very safe one to go by—is that, in general, and always with primiparæ, you take off your forceps as soon as the perineum begins to bulge, and that you leave the final delivery of the head to the expulsive efforts of your patient. Yet there are cases where the very use of the forceps protects the perineum. Thus, for instance, whenever the pubic arch is too narrow, the sacrum is too straight, or the head in an occipito-anterior position is overflexed, and the vertex bears on the perineal centre and threatens to perforate it; whenever, in an occipito-posterior position, the head is too little flexed—the forceps is urgently needed."

The author very strongly urges that in all lacerations, where anything more than the fourchette is torn, the immediate operation should be had recourse to, and with the aid of a

woodcut, explains how silver sutures may most efficiently be placed. The details of the secondary operation for this condition are given with great minuteness and care.

Lesson X treats of metritis and endometritis, acute and chronic. For dealing with these affections he recommends iodine, carbolic acid, chloral, and fuming nitric acid. The routine practice of many medical men, which consists in the use of a stick of nitrate of silver, he condemns very strongly. "The common practice of treating these erosions with the solid stick of lunar caustic is a bad one, on account of the cicatricial tissues which it leaves behind. Such a dense and gristly tissue often pinches peripheral nerve-filaments so severely as to produce ovarian or uterine neuralgia, wholly or partly quenching sexual desire, and causing other psychological disturbances." Every one who has treated many cases of this sort, has found out for himself that the application of caustic to the os uteri only, is like cutting down weeds instead of rooting them out; they soon reappear. Accordingly, Dr. Goodell advises intra-uterine treatment. "The applicator thus armed, after being dipped into one of the above liquids, I always carry through a speculum, up to the fundus of the womb, whenever the internal os permits it to pass. In the great majority of cases this can be done, provided the forelip of the cervix is first hooked down by the uterine tenaculum; a procedure which steadies the womb and straightens it out. My reasons for cauterising the whole mucous tract of the womb are fourfold. (a) If the mucous coat be alone involved, the symptoms often fail to inform me how far up the disease has extended. (b) Owing to the absence of any sub-mucous connective tissue, the inflammation of the mucous membrane must, sooner or later, more or less involve the parenchymatous structures, and this must be avoided at all hazards. (c) Whenever the internal os is sufficiently patent to admit the armed applicator, I accept this fact as an evidence that the disease is not limited to the cervix. (d) By this practice, in a measure empirical, I err on the safe side, and obtain far better results than I did when limiting my applications to the cervical canal."

The diagnosis of retroversion and retroflexion of the womb is given in a very clear and practical way.

Dr. Goodell lauds the volsella forceps. "Since it maintains its hold better than the single tenaculum, and is more out of the way than the double tenaculum, it is to me one of the most precious instruments in my bag, amounting in value almost to a third hand." Our experience is, that if the single

tenaculum is not too fine, and if a good hold be taken of the tissue of the cervix, it does all that the volsella can do, and is not nearly so much in the way of the operator.

In the treatment of anteversion it is stated that no special form of pessary is invariably beneficial, but that Smith's Thomas', Grailly Hewitt's, and Hodge's are all useful, one often giving relief when the others fail. For the most of cases he employs the pessary suggested by Dr. Gehrung of St. Louis, which is practically a doubled-over Hodge, the upper part of which maintains the cervix in a more or less normal position.

For the relief and cure of flexions and dysmenorrhea, Dr. Goodell has great faith in rapid dilatation of the cervical canal, and, for this purpose, uses Ellinger's dilator, which has short beaks, and opens with the blades parallel to each other. He contends, and we think justly, that rapid dilatation will often obviate the necessity for using tents and attain the end with less danger to the patient. In the section on uterine tents there are some observations which are so true, so important, and withal so little recognised by general practitioners that we cannot refrain from quoting them in full. "Let me here impress upon my readers the importance of dilating the cervical canal with but one introduction, or, at the most, with but two introductions of tents. It is not, save with rare exceptions, the tent or the batch of tents, crowded in at the first visit, that is attended with risk, but those inserted at the second or at the third visit. The history of the reported fatal cases shows that the danger increases with every relay of tents. It is greater at the second and greatest at the third. This is probably owing to the fact that the removal of the first tent, or first batch of tents, more or less abrades the now irritated mucous coat of the canal, and by this raw surface are absorbed the putrid discharges generated and retained by the subsequent tents. It is especially in cases of previous pelvic inflammation, and in those of interstitial or of submucous fibroids, that I dread the effect of a series of tents, and avoid such a use of them as much as possible."

For the instruction of those who have not had much experience with the lever pessary, Dr. Goodell gives the following simple rules:—"1st. The uterine, or upper end, must always lodge behind the cervix uteri. 2nd. Always in the Smith pessary, and usually in the Hodge pessary, the uterine end is the one which has the large curve. 3rd. The concavity of the large curve must always look toward the anterior wall of the vagina, and the convexity rests upon its posterior wall. 4th.

When *in situ*, the pessary should fit so loosely as to be freely movable, and to admit the finger very easily between its anterior bar and the pubic symphysis. 5th. In retroflexions the pessary must be long enough to span the angle of flexure in the womb, and to press on the fundus; otherwise, the bent womb straddles the pessary, and the flexion becomes worse."

When from ovarian or uterine tenderness a woman becomes unable to walk, abdominal supporters are recommended. The fact that they often give relief is certified, and the rationale is thought to be as follows:—"From the oblique inclination of the pelvis to the spinal column, which is produced by the natural hollow in the back, and by the more or less sigmoid shape of the spine, the axis of the trunk does not coincide with that of the pelvis. The womb and the ovaries, therefore, lie in a measure under the shelter of the sacral promontory and of the lower lumbar vertebrae. For the same reason, the sum of the weight of the supernatant abdominal viscera is spent upon the smooth surface of the pubic bones, and upon the lower abdominal wall, but not upon the womb, although it is the lowest of the pelvic organs. The little pressure to which it is subjected is not in a vertical line, but in an oblique one. A displaced or a flexed womb may in itself give rise to no unpleasant symptoms whatever; but let it once take on a congested or an inflamed condition, and the weight of the abdominal viscera at once becomes oppressive. If, now, pessaries being found inadmissible, a suitable brace be put on, a portion of this load is taken off by its pad, which, by pressing the abdominal wall upward and inward toward the sacral promontory, forms a shelf upon which the viscera rest. Further, by this virtual shortening of the conjugate diameter of the superior strait, the space into which the viscera tend to settle is lessened, and consequently the womb is to that extent the more protected from sudden succussions."

Dr. Emmet, who devised the operation for the cure of ununited laceration of the cervix, thinks that that condition is the cause of most uterine disorders. Dr. Goodell does not go quite so far as that, but he has "often seen profuse menorrhagia, stubborn leucorrhea, cervical and corporeal hyperplasia, chronic ovaritis, and every kind of prolapse of the womb, starting from such a rent." The cause of these lacerations he believes to be too early artificial rupture of the membranes, which he strongly condemns. The cure is to be brought about by Emmet's operation, and two cases are given where this procedure resulted in the relief of very serious symptoms.

The author thinks that cancer of the womb is generally epitheliomatous, and could be cured more frequently if it were earlier seen. He recommends excision of the cervix by means of the galvanic cautery, the wire ecraseur, and Simon's spoon. Where cancerous disease has attacked the fundus, and not yet invaded the neighbouring parts, he advises and gives details of Freund's operation for removal of the uterus by abdominal incision. The fact is mentioned that Blundell proposed and executed the total extirpation of the diseased womb through the vagina. Dr. Goodell says that such bad success has followed this operation, that it has quite fallen into disuse. This is not the fact, however, for such men as Carl Braun and Th. Billroth of Vienna are practising the operation at the present time, and we know that the latter has performed it at least three times within the last six months.

Lesson XXI is taken up with the consideration of vegetations of the endometrium, which are divided into three classes—(1) Fungous, (2) Villous, and (3) Sarcomatous degeneration of the endometrium. These are all to be treated in very much the same way, viz.:—by the curette, intra-uterine applications of carbolic acid, iodine, fuming nitric acid, or the actual cautery. A number of cases is given where these methods of treatment were productive of much good. The prognosis in the sarcomatous variety is, of course, very bad.

In dealing with the subject of intra-uterine polypus, the author calls attention to a fact which we do not remember having seen mentioned before. "During the catamenial flux, the temporary increase in the bulk of the tumour, through congestion, together with the resulting labour like pains, so opens up the canal as often to permit the passage of the finger. Some polypi have actually appeared in the vagina during the period, and have afterwards been so withdrawn into the uterine cavity, as to escape detection at a subsequent examination. This fact should be explained to the woman, else her innate feeling of delicacy would cause her to shrink from an examination at such a time."

In regard to the removal of polypi during pregnancy, he points out that they should never be interfered with till the woman has passed the fourth month at least, as there is, after that time, much less risk of the operation causing miscarriage.

Fibroids of the womb is the subject of Lesson XXIII. Where one is baffled in the exploration of the uterine cavity while using a metallic sound, it is recommended that a gum elastic bougie, stiffened with its wire only as far as the os uteri, should be used. In our hands this has proved a very

deceptive means of diagnosis; the point of the flexible instrument simply turned round when it met any obstruction. A more reliable and yet very pliant tool for this purpose is a thin whalebone sound with a somewhat bulbous point. It does not readily bend round at the point, and yet accommodates itself to the flexures of the abnormal uterine walls. In speaking of the mischief which may be done by the use of the sound, he adds, "In the treatment of uterine diseases remember this golden rule—Think twice before you pass the sound."

The treatment of fibroids is given very fully and clearly, and it is mentioned that, for the division of the capsule of interstitial or submucous fibroids, Adam's subcutaneous saw has been found to be most useful and safe.

For obstinate and severe ovaritis, as well as for fibroids, when the patient is still at a distance from the menopause, Dr. Goodell strongly recommends the operation of spaying. The details of seven cases are given, where the ovaries were removed, mostly, as the author advises, by vaginal incision, for chronic ovaritis and ovarian dysmenorrhea. The results generally were good, although one of the cases in which the abdominal incision was practised ended in the death of the patient from septicæmia on the sixth day. One drawback to spaying is that sometimes menstruation continues after both ovaries have been removed. This is accounted for by the fact that some women possess an accessory ovary. Beigel, in 350 *post-mortem* examinations, found eight with a third ovary containing true ovarian stroma. Some of these glands were only the size of a hemp seed. It is not considered, however, that the percentage of recurring menstruation is sufficiently large to deter one from performing the operation.

Ovariotomy is described in great detail. The author believes in the use of carbolic spray, ligatures the pedicle with fine silk and drops it, uses Keith's glass drainage tubes, and, if need be, washes out the abdominal cavity twice a day through this tube with carbolic acid. Where the cyst is small or fixed in Douglas' pouch, removal by vaginal incision is strongly recommended, in which case, irrigation of the peritoneal cavity is thought of great value, especially where any accumulation of fluids has taken place.

We think Dr. Goodell's argument for delaying the performance of ovariotomy till the tumour is large, is unsound. He says, "When should the operation be performed? Not when the cyst has first been discovered, but when it has grown so large as to distend the belly, and when the woman has become

thin and her health has begun to fail. The reasons for waiting are, that the woman will have lived longer should the operation turn out to be a fatal one; that the abdominal wall having become thinner, the incision will be proportionally shorter and shallower; that the patient being now less full blooded, both haemorrhage and inflammation will not be so likely to occur; and that the pressure and rubbing to which the peritoneum has been for some time subjected will make it less vulnerable, and therefore less likely to take on inflammatory action." A woman carrying about an ovarian tumour, and knowing that it must be operated upon at no distant date, cannot enjoy life; the fact that her health is failing will not render her chance of recovery greater, and, most important of all, adhesions may meanwhile form, of such a nature as to make the operation vastly more formidable. It seems to us that if we could diagnose ovarian tumours while yet of small size, and remove them through the vagina, the best results would be obtained.

In Lesson XXX are given four cases of very chronic and severe dysmenorrhea rapidly cured by seclusion in bed, massage, electricity, and food. Massage consists of—"1. *Effleurage*, stroking, friction, or surface rubbing. 2. *Petrissage*, kneading, or deep rubbing. 3. *Tapotement*, tapping, or percussion. 4. Passive and active motion." It would appear that hysteria goes to greater lengths in America than it does in Scotland. Here, probably, seclusion in bed and a limited quantity of plain food would cure most of our cases of hysterical dysmenorrhea without the assistance of massage and electricity.

There is a sensible chapter on the prevention of uterine disorders, which it would be well to have put into the hands of not a few thoughtless mothers in this country. Stays, sewing machines, boarding school accomplishments, candies, dough nuts, hot biscuits, and late dancing parties come in for sweeping denunciation; yellow backed novels, over lactation, and faulty closet accommodation fare little better, the evils of which they are the causes being exposed with no sparing hand.

The volume closes with a chapter on sexual relations as causes of uterine disease. Long engagements between young people are condemned. The methods for the limitation of families, which seem to be practised by so many people in America are either, as we think, altogether unknown in our country, or practised with such signal ill success as must soon utterly dishearten the would-be evil doers.

The book is illustrated by ninety-two woodcuts, most of

them good, especially the drawings of instruments and diagrams of operations. The style is such that one can read on without getting readily tired; some of it may even be called light reading, as witness the passage already quoted on the methods of supporting the perineum.

The great value of the work is its practicalness. Little points of detail turn up on almost every page, showing that it is, like Dr. Percival Willughby's book on *Midwifery*, "not feigned, or the surmised thoughts, nuctors, or man's fantasie, sitting and meditating in his studye," but the work of a man who has often done what he wishes to teach his reader to do.

We cannot but commend the book to those who are, or who wish to become, gynecologists.

The Pharmacopœia of the British Hospital for Diseases of the Skin. Edited by BALMANNO SQUIRE, M.B. Lond. London : J. & A. Churchill. 1880.

THE editor's aim in arranging this collection of remedies has been "to attain simplicity in the formulæ and conciseness in the directions," and in this endeavour he has been almost too successful, as in many instances the simplicity and conciseness of his prescriptions degenerate into mere baldness and inelegance, such as one hardly looks for from any one bearing the name of Squire. Thus, the "mixtures," to a large extent, consist simply of the average dose of the active ingredient dissolved in an ounce of water; the use of adjuvants, corrigents, &c., being neglected in a manner that would have been condemned by many, especially of the older authors. It is to be regretted also that the work should present such an incomplete guide to the practice at the British Hospital for Skin Diseases, as must necessarily be the case from the fact that all prescriptions for skin treatment already provided in the British Pharmacopœia are omitted. The practitioner, therefore, who expects to find in this book, as its title might suggest, a moderately exhaustive grouping of all the approved formulæ used in dermatological practice, together with intelligible directions as to the circumstances and manner in which the remedies are to be employed, will be disappointed; for this he must still trust to his text book of skin diseases. Apart from these drawbacks, however, the work is one of value. Even the mere reading over of this list of prescriptions could scarcely fail to suggest some line of treatment to those in difficulties, particularly as most of the newer additions to skin therapeutics are here noticed. The means of reference

are ample; the index taking up 16 of the 92 pages of which the work consists. The prescriptions are also so constructed as to be easily remembered, the total quantity of each being reduced, whenever possible, to one ounce. There are several small slips of the pen in these pages which would bear correction, thus :—*huile de cade* is not obtained from *Juniperus Communis*, but from *J. Oxycedrus*; *pilula podophylli cum nuce vomicæ* is bad Latin; the direction to wash with “warm soap and water” is clumsy; and the statement that Venetian talc is a mineral “of an unctuous feel” is inelegant.

Atlas of Skin Diseases. Part VII. By DR. LOUIS A. DUHRING. Philadelphia: J. B. Lippincott & Co. 1880.

SOME months ago we had occasion to notice parts I to VI of this excellent *Atlas*, and expressed a very favourable opinion regarding them. This part quite sustains the high reputation established by its predecessors. It includes lithographic illustrations of *eczema pustulosum*, *impetigo contagiosa*, *syphiloderma papulosum*, and *lupus vulgaris*. The representations given by these plates of the various diseases mentioned are most faithful and life-like, and approach as near perfection as anything of the kind we have seen. The accompanying text is, as before, concise, practical, and clear; it consists essentially of a description of the particular case chosen for illustration, and the method of treatment adopted, together with a few more general observations on the nature and course of the affection. We again commend this *Atlas* to the attention of practitioners and others.

PERISCOPE OF DERMATOLOGY.

No. II.

By A. NAPIER, M.D.

Physician for Skin Diseases, Anderson's College Dispensary.

1. *Atropine Eczema*.—In this case the introduction of a few drops of a 1 per cent solution of sulphate of atropine into the eye was invariably followed by severe eczema and pseudo-erysipelatous swelling and redness of the face and neck. The patient was a woman of forty-five, of good con-

stitution, with chronic disease of the left eye giving rise to corneal opacity and synechiæ.—(M. Donath, in *Wiener Med. Wochensch. Med. Times and Gaz.* 17th April, 1880).

2. *Nervous Lesions in Zoster.*—A careful histological examination, in the case of a phthisical patient who had died while suffering from zoster, showed that the lesions corresponding to the parts attacked by the eruption were localised more particularly in the corresponding intervertebral ganglia. Normally these structures consist (1) of a fibrous stroma, which proceeds from the internal aspect of their capsule; (2) of nerve tubules, which come from the posterior columns of the cord, penetrate into the interior of the ganglia, and spread out in its substance in passing through it; (3) of nerve cells of considerable size. In the present case the following changes were found in the ganglia:—Certain portions had undergone complete transformation, and showed neither nerve cells nor tubules, but consisted of a dense and fasciculated connective tissue; these parts were in a condition of absolute sclerosis. In immediately adjoining portions, however, the structure was absolutely normal. Between these extremes, representing on the one hand a state of complete sclerosis, and on the other a condition of apparent health, every possible intermediate stage was found; the diseased structures merged gradually into those which were normal.

The intercostal nerves rising from the affected intervertebral ganglia were examined and compared with others emerging from healthy ganglia, but no precise result was obtained; if any lesion were present, it was not very obvious. The sympathetic chain and ganglia presented no alteration. This case is destined to become classic, its value depending on the extreme care bestowed on the investigation.—(M. Chadelux in *Arch. de Physiol.*) *Lyon Méd.* 18th April, 1880.

3. *Caution with regard to Pyrogallic Acid.*—Pyrogallic acid applied externally may, under certain circumstances, become a violent poison. In a case of universal psoriasis under Neisler's treatment, an ointment containing 10 per cent of the acid was rubbed into one-half the body, while the other half was treated with chrysarobine. In a few hours the patient had rigors, nausea, and collapse; coma eventually supervened, and death took place on the fourth day; the urine was very scanty and blood-coloured. Following this, experiments were made on rabbits. The subcutaneous injection of large doses of various preparations of araroba produced no noxious effects; but the same experiments with pyrogallic acid produced toxic effects—rigors, dyspncea, trembling in the limbs, hæmoglobinuria,

engorgement of uriniferous tubules with cylinders of haemoglobuline, and eventually death. Neisler attributes this action of the acid to the power it possesses of absorbing oxygen in the presence of alkalies, and to the decomposition which results ; the red blood globules are destroyed, their colouring matter dissolved in the plasma ; the haemoglobinuria is the cause of death, less because it closes the uriniferous tubules and produces anuria, than because this renal obstruction retains in the blood the pyrogallic acid, which thus continues to exercise its destructive action. The moral is, that in no case should pyrogallic acid be employed in cutaneous affections spread over a large surface of the body. In cases of poisoning by this agent it would be reasonable to perform venesection, then transfusion, and subsequently to excite strong diuresis.—(*La Presse Méd. Belge.*) *Med. Press and Circular.* 14th April, 1880.

4. *Substitute for the German "Sapo Viridis."*—Dr. G. H. Fox proposes, as a substitute for the German "green soap," a soft olive soap used extensively in the manufacture of silk and other delicate fabrics. This he has tried and found to be similar to the ordinary *sapo viridis*, but a far more elegant article. It is made from cold pressed olive oil, and owes its green colour entirely to the chlorophyl of the olive. As manufactured in New York it is of unvarying alkalinity, wholly free from unpleasant odour, homogeneous, and, unlike the common green soap, it gives a perfectly clear solution with strong or dilute alcohol. It is found advantageous to add to it a small percentage of glycerine, which, while counterbalancing the natural loss of free water, renders it a most agreeable preparation. The name proposed for this soap is "*Sapo Olivæ Præparatus.*"—*Med. News and Abstract.* April, 1880.

5. *Treatment of Ringworm.*—Dr. Alder Smith recommends, as an excellent remedy in recent cases of ringworm, a mixture of carbolic acid (the pure crystals melted) and glycerine in equal proportions, or one of the former to three of the latter, according to the extent of the surface to which it is to be applied, the age of the patient, or the effect produced. The glycerine penetrates freely, and carries the acid to the conidia. The application is cleanly, seldom painful, and though it has been used freely for eight years, a toxic effect has only once been produced. The remedy should be rubbed in twice or thrice a day, with a mop made by tying a small piece of sponge on a penholder. The treatment will take two or three months to effect a complete cure and to get the downy hair to grow. When there is a large extent of surface involved, the

following ointment may be used: pure carbolic acid, strong citrine ointment, and sulphur ointment in equal parts; to be made fresh every day. This can be applied without fear, at any rate to children over ten, to the entire scalp every night, and to the patches again the next morning. The ointment causes no pain, and is very effectual.—(*Lancet.*) *Practitioner.* April, 1880.

6. *Treatment of Intertrigo in Infants.*—Powders should be dusted on the skin only when the epidermis is sound; when there are excoriations, ungt. diachyli renders good service in recent cases. Sometimes it fails, when corrosive sublimate (gr. i to 3 iv) should be frequently applied.—(Dr. Wertheimer, in *Deutsch. Archiv f. Klin. Med.*) *Practitioner.* April, 1880.

7. *Etiology of True Leprosy.*—Mr. Jonathan Hutchinson holds that true leprosy must be due to the long continued use of some article of food; in no other way can he account for its former wide distribution, gradual disappearance, and present continuance in certain districts. It cannot be accounted for by hard living or bad food merely, as it occurs in very different climates and in persons of very different habits and positions in life; it is not simply hereditary, but can be induced in persons born and bred in England, but who have resided for a comparatively short period in an infected district; it does not affect all who are exposed, but picks out one here and another there.

Various articles of food have been blamed for its production, such as milk, pork, maize, bad corn, &c.; Mr. H., however, regards fish, or rather some poison generated in connection with fish, as the one sole cause of true leprosy. Certain conditions modify the action of this cause; in some places a large quantity is required to produce the disease, in others a small quantity will suffice; fish bred in warm waters is more dangerous than that found in cold; the crustacea, and fish in a state of decomposition, are more dangerous than fresh fish. Fish is largely eaten wherever leprosy prevails; the affection is most common on the sea shore, and when it spreads inland it follows the shores of lakes and the courses of rivers. The history of the disease supports this view. The Hebrews acquired the fish-eating habits of the Egyptians, and with them leprosy. The disease everywhere faded away before the advance of agriculture, the growth of population, and progress of civilisation generally.

This theory is further supported by a number of facts relative to the present distribution of the disease; such as its prevalence in Norway, the Faroe Islands, Russia, Madeira,

India, Burmah, the West Indies.—*Med. Press and Circular.*
11th August, 1880.

8. *Pathology of Purpura Hæmorrhagica.*—After fully describing three interesting cases of this affection, Dr. J. M. Finny gives his views as to its pathology. He holds that it is the nervous system which is primarily at fault, and that through the influence of the vaso-motor system the blood and the capillaries are secondarily affected. For this belief he gives the following reasons:—

(1.) Most cases of purpura present a history pointing to some nerve waste, such as over-fatigue, &c.

(2.) The prominent symptoms at the onset of the disease, long prior to the occurrence of cutaneous hæmorrhages, throughout its course, and for some time after the cessation of all bleeding, is that of exhaustion, muscular weakness, and fatigue; and this holds good whether or not the attack be accompanied by pyrexia.

(3.) The analogy which exists in the acknowledged influence of the sympathetic nerve over cutaneous eruptions, such as erythema and herpes, and the altered pigmentation in pregnancy, leucoderma, and morbus Addisoni.

(4.) The symmetry of the eruption; the rapid manner in which purpura at times makes its appearance; and the still more remarkable way in which further hæmorrhages are abruptly arrested while the patient is exposed to the same circumstances, hygienic and dietetic, and while the constitution of the blood can hardly have undergone any alteration.

(5.) The close connection between disease of the cerebro-spinal centres and purpura, such as that manifested in malignant purpuric (or cerebro-spinal) fever.—*Brit. Med. Journal.*
29th May, 1880.

9. *Treatment of Ringworm by Croton Oil.*—In obstinate chronic ringworm, affecting limited portions of the scalp, Mr. W. Cottle obtains the best results from painting the parts with croton liniment and directing the subsequent frequent use of an ointment or lotion of salicylic acid. One application of the croton oil usually suffices to produce a copious pustular rash; if it fail to do so the application should be repeated. An ointment of 10-40 grains of salicylic to the ounce of vaseline should then be rubbed over the scalp twice or thrice daily, its strength, frequency, and vigour being proportioned to the inflammatory effect produced. Though this method of treatment is neither suitable to every case nor universally successful, it possesses some advantages. 1. The croton oil liniment gives rise to no pain at the time of its application, while the

consequent suppuration is not in most cases more irksome to the patient than the prolonged and acute pain that attends the use of the usual caustics. 2. Permanent loss of hair does not result. 3. The treatment is easy to carry out. 4. Many intractable cases rapidly mend when so dealt with. 5. The agents employed are not poisonous. Measures must be taken to prevent the further extension of the disease, and suitable constitutional treatment must be adopted when necessary. Recent cases in healthy individuals may be very well dealt with by almost any of the usual remedies; less active treatment is preferable also if there exist any tendency to eczema or scalp irritation.—*Brit. Med. Journal.* 29th May, 1880.

10. *A Case of Abnormal Pigmentation, and its cause.*—The patient in this case had had typhus fever. While convalescence seemed to be progressing favourably, her body was gradually covered, throughout its whole extent, by well marked spots of pigmentation, as in a case recorded not long ago by Dr. Litten. Shortly after seeing the above case the author, Dr. Kocher, had the opportunity of observing a patient suffering from profound anaemia, whose body was soon covered with precisely similar pigmentary spots. He is accordingly inclined to think that in the case first referred to the pigmentation was due, not to the typhus directly, but to the resulting anaemia.—(*Charité-Annalen*, V, p. 341.) *Centralblatt. f. d. Med. Wissensch.* 14th August, 1880.

11. *Nervous Lesions in a case of Anæsthetic Leprosy.*—Tschorjew reports (in *Arch. de Phys. Norm. et Path.*, 1879, p. 614) the examination of the spinal cord in a case of anæsthetic leprosy. He found that in the gray substance of the posterior horns the ganglion cells were fewer than normally, atrophied, and at some parts absolutely wanting. In the anterior horns the ganglion cells preserved their normal appearances.—*Centralblatt. f. d. Med. Wiss.* 14th August, 1880.

12. *A Chemical Study of Pemphigus.*—The fluid contained in pemphigus vesicles is, according to Jarisch (*Wiener Acad. Sitzgsb.*, lxxx, 3, p. 158), alkaline in reaction, without smell, of a clear yellow colour, slightly opalescent, and of sp. gr. 1019. Solids are present in it to the extent of 58·1 parts per 1,000; the organic constituents detected were serum-albumen, paraglobulin, and a small proportion of fat. It yielded 8·1 per 1,000 of ash, which contained the usual elements, the soda compounds predominating over the potash compounds. The urine was minutely examined, but showed nothing abnormal; contrary to the views enunciated by Bamberger, its ammoniacal

constituents were not increased. A second examination of the vesicle-contents in this same case resulted in the detection of urea. In another case the analysis yielded similar results; urea was discovered, but no salts of ammonia. The fluid contained 5.37 per cent of solids, 3.79 per cent serum-albumen, and 4.3 per cent paraglobulin. Urine normal. For the sake of comparison the author also analysed the contents of vesicles due to burns; the fluid in this case was found to have almost precisely the same composition as the fluid from pemphigus vesicles, but the proportion of soda salts was somewhat smaller.
—*Centralblatt f. d. Med. Wissenschaften.* 14th August, 1880.

13. *Treatment of Palmar and Plantar Syphilitic Psoriasis.*—Preparations of corrosive sublimate should be painted once or twice daily on the papules, pustules, and crusts, after bathing the parts; compresses of solution of acetate of lead will lessen pain and prevent irritation. For lesions in the soles and palms, the best excipient in which to prescribe the sublimate is collodion; for tender parts of the skin and for the slighter manifestations of syphilis, alcohol; for lesions of the mucous membrane, ether.

Very obstinate palmar or plantar psoriasis should be painted every morning with an application consisting of one part of corrosive sublimate, one of fresh linseed oil, and fifteen to twenty-five of collodion. In the evening the parts should be energetically rubbed with white precipitate ointment (1 part of ammoniated mercury to 5 of simple ointment).

In cases marked by deep fissures and considerable infiltration, local baths with a 2.5 per cent solution of carbolic acid, or a five per cent solution of chloride of potassium or sodium, or rubbing with zinc ointment or sparadrap de Vigo, will be found useful. Merely constitutional treatment is unavailing.
—*Wiener Med. Wochensch.* Lyon Médical. 16th May, 1880.

14. *Treatment of Acne by soft Potash Soap.*—Dr. Grauvaux uses the black or green potash soap, for the treatment of acne, in the following combinations:—Dissolve two parts of the soap in one part of rectified spirit, filter, and add a sufficiency of tincture of lavender, or some other aromatic substance, to mask the unpleasant odour of the soap; the mixture should then be evaporated to the consistence of a paste. Another formula which may be used is this:—Perfumer's soap cream, 100 grammes; caustic potash, 20-50 centigrammes; mix, and add 10 drops of tincture of benzoin. A little of either of these preparations is rubbed lightly on the skin at bed time, and allowed to remain on all night; in the morning it is washed

off with warm water. This should be done four nights in succession. The pain so caused is considerable, but is readily enough borne. On the fifth day the soap preparation should be omitted and replaced by warm vapour douches, or emollient preparations of bran or starch, and these are kept up for at least four days. This treatment must be continued as long as necessary, the soap and emollient applications being used alternately, in periods of four days.—(*Thèse de Paris.* No. 255, 1879). *Bull. Gen. de Thérap.* 30th April, 1880.

15. *Treatment of Lupus by Carbolic Acid.*—Two cases of lupus are here recorded. In the first case, that of an unhealthy anaemic girl, aged 16, the disease had lasted two and a half years, and had caused partial destruction of the right ala of the nose; there were also patches of lupoid ulceration on septum and floor of nasal cavity, upper gum on right side, and left tonsil. Cod-liver oil and syrup of the iodide of iron were given internally, while the diseased parts were painted twice a week with pure carbolic acid. In a little over two months the cure was complete.

The disease in the second patient, a woman of 45, had begun three years before on the tip of the nose, and was of the variety known as lupus erythematodes. It involved the entire muco-cutaneous surface of the nostrils; the external surface of the nose, extending as high as the bridge and the cheeks on either side, was dark red in colour, with here and there small patches of a deeper red and a few small ulcerations; the entire red portion was covered with dry bran-like scales. Treatment: 4 m. of liq. arsenicalis thrice daily; a poultice to remove scabs; painting the ulcerated parts three times a week with pure carbolic acid, and the non-ulcerated portion twice. The result in this case was even better than in the last, as the patient was discharged cured in rather less than a month.—J. C. Hall, M.B., in *Med. Press and Circular.* 25th August, 1880.

16. *Infantile Eczema Complicated by Dyspnœa.*—At a recent meeting of the Société Médicale des Hôpitaux, M. Blachez gave an account of a case of the above-described nature. The patient, a strong and vigorous child, aged 23 months, had suffered since it was five months old from eczema, affecting the whole body. After the disease had lasted rather more than a year, the child had several attacks of dyspnœa so severe as almost to threaten life, the pulse becoming exceedingly rapid (160-180), respiration hurried, and the skin cold and livid. These symptoms were relieved by emetics, and the seizures generally passed off in a few days. It was

noticed also that, for a few days subsequently, the itching and irritation of the eruption became so intense as to render the little patient almost frantic. M. Blachez rejects the diagnosis of asthma, and supposes rather that the dyspnoea is due to some lesion of the nervous system, such as is often associated with eruptions. He quotes the researches of Marchetti, of Florence, who had observed very decided changes in the sympathetic in several fatal cases of generalised eczema; and suggests that, in the case under consideration, the dyspnoeal symptoms were caused by some transient inflammatory condition of certain branches of the sympathetic nerve.—*Bull. Gén. de Thérap.* 15th June, 1880.

17. *Vaccinal Eruptions*.—M. Hervieux, in presenting to the Académie de Médecine his report on vaccination for 1878-79, formulated the following important propositions with regard to multiple vaccinal eruptions:

(1.) Vaccinal eruptions are of two kinds: those caused by accidental inoculation, as by the nails, accidental pricks with the vaccinating instrument, &c.; and those resulting spontaneously, as in the exanthemata, from general infection of the system.

(2.) Spontaneous vaccinal eruptions may be primary, appearing simultaneously with the vaccine vesicle proper; or they may be secondary, developing at a later period, usually the ninth or eleventh day. In the first case the eruption presents the same character as the ordinary vaccine vesicle; in the second case it assumes very various forms,—erythematous, miliary, vesicular, papular, &c.

(3.) In patients subject to eczema, impetigo, or chronic diseases of the skin, the vaccinal eruption, generally mild and discrete, readily takes on a graver character, becomes confluent, and is generally limited to the parts affected by the cutaneous disease.—*Bull. Gén. de Thérap.* 15th June, 1880.

18. *A Vasomotor Affection of the Skin*.—Dr. Appenrodt applies this term to an inflammatory disease of the skin, which appeared six times within two years, in the person of a scrofulous boy of 13. It at first showed a close resemblance to erysipelas, erythema exudativum, erythema from burns, and eczema, but the course which it followed sufficiently distinguished it from these diseases. Each attack set in very suddenly; the eruption always began on the nose, and consisted of sharply defined streaks and spots of vivid erythema, accompanied by an acute burning sensation, great sensibility to pressure, and deep serous infiltration, but seldom by any disturbance of the general health. There was no appearance

of vesicles, and the eruption showed no tendency to spread. The spots were irregular in shape, but arranged symmetrically. No cause was discovered. Neither internal nor external treatment had any effect.—(*Deutsche Med. Woch.*) *Cbl. f. d. Med. Wiss.* 31st July, 1880.

19. *The Structure of Lupous Tissue.*—Dr. A. Jarisch has investigated the structure of the tissues cut from the border of lupous patches and stained with chloride of gold; the cases from which they were removed were examples of lupus maculosus, tuberosus, and tumidus. The author finds that it is the connective tissue cells which take the chief part in the morbid process, and not, as Cohnheim thinks, migrated blood corpuscles. The first step in the process is a considerable new formation of blood-vessels; this causes the connective tissue corpuscles to swell, and subsequently to subdivide into masses of round cells.—(*Viertelj. f. derm. u. syph.*) *Cbl. f. Chir.* 10th July, 1880.

20. *A New Parasitic Affection of the Skin.*—A series of cases of an inflammatory disease of the skin, due to the presence of a hitherto undescribed form of parasite, has been observed by Dr. E. Geber in Siebenbürgen. The persons attacked were some day labourers who were engaged unloading barley. Shortly after beginning their work they exhibited signs of violent irritation of the skin, an acute burning sensation, and intense itching, which were obviously caused by a yellowish-brown powder which fell in abundance from the grain. This powder, on microscopic examination, was found to consist almost exclusively of small insects, living, dead, and rudimentary. By sprinkling the powder on the skin, three groups of phenomena could be produced. If the powder were allowed to remain on only a short time, more or less acute urticaria was set up, which lasted about a day and a half, though the insects died in a few hours. When the irritation was longer continued and more intense, and when the skin was sensitive, not only the wheals of urticaria appeared, but also the papules, vesicles, and pustules of a concomitant eczema, which lasted some time longer than the urticaria; to these symptoms were sometimes added sleeplessness, loss of appetite, and moderate fever, the whole disorder lasting four to six days. In the most severe cases there were very marked signs of dermatitis, the skin over a large extent of surface became hot, swollen, and red, a painful burning sensation was felt in the parts, the general temperature rose, and thirst became urgent. The inflammatory process reached its acme, remained stationary one to two days, and then gradually

subsided, being followed by coarse desquamation. The insects, which are named by the author, *chrioptes monunguiculosis*, belonged to the acari, were oval in shape, yellowish-white in colour, and about 0·022 mm. long; they had conical-shaped heads, and 4 pairs of feet. As neither eggs nor embryos were found, nor any sexual distinctions noticed, it is assumed that the insects were in an intermediate stage in their development.—(*Wiener Med. Presse.*) *Cbl. f. Chir.* 7th August, 1880.

21. *Two Cases of Severe Prurigo Treated Successfully.*—As genuine prurigo is an extremely serious disorder and very rebellious to treatment, these cases are of considerable interest. The first patient was a youth of 19, who had suffered from the affection from his earliest childhood. A sulphur bath daily, inunction with carbolic oil ($\frac{1}{2}\%$) every second day, and Fowler's solution, internally produced marked improvement; the treatment had to be suspended for a short time on account of the appearance of symptoms of carbolism, but, on being resumed, it effected a cure very speedily. There was no relapse. A child, aged 2 years, also suffered from the disease in a very pronounced form, and got perfectly well under the use of tarry preparations applied to the body and ungt. diachyli to the face. The child was subsequently under observation for several years, and showed no signs of relapse.—(*Wiener Med. Wochensch.*) *Cbl. f. Chir.* 7th August, 1880.

22. *The Parasite in Alopecia Areata.*—Dr. H. Eichhorst records some observations made on the hair taken from the margins of some patches of undoubted alopecia areata. The patient was a man of 53. The disease had appeared first in the beard some years previously, and had spread to the hair of the head. The hairs were very easily extracted; to a few of them only was the upper half of the root-sheath adherent, the majority of them coming away destitute of root-sheath. They were treated first with liquor potassæ, then with alcohol, and stained with Bismarck brown. In the upper part of the root was noticed a well marked atrophic zone, which took up none of the colouring agent. In the few instances in which a portion of the root-sheath had remained adherent to the hair, great numbers of spores were seen lying between hair and sheath; these had a double contour, and varied in diameter from 1-4 micromillimetres. These spores were also found in groups between the epithelial cells of the root-sheath; they never penetrated into the interior of the cells, but were arranged on their surface. No trace of mycelial threads was observed. The localised atrophy of the hair was plainly

connected with the presence of the spores. The author concludes from these observations that, though all cases of alopecia areata cannot be said to be of parasitic origin, cases do occur which are undoubtedly of this nature.—(*Virchow's Archiv.* Bd. lxxviii, p. 197.) *Cbl. f. Chir.* 15th May, 1880.

23. *Bacillus Lepræ*.—It is stated by Dr. G. A. Hansen, in *Virchow's Arch.*, lxxix, p. 31, that if search be made in the tubercles of leprosy, small rod-shaped bodies will constantly be found. In freshly-drawn blood no such bodies are seen, but in blood preparations kept in a moist cell jointed threads are often observed, and these, as they do not occur in the blood, similarly treated, of healthy or syphilitic subjects, are regarded by the author as a specific parasitic growth. Even in fresh sections of the lepra-tubercles, before adding any reagent, these bacteria are visible, some of them having a straight regular outline with parallel sides, others being somewhat pointed at each end; the pointed bodies are twice the width of the others across the middle. Similar bodies are discovered, free and in active vibratory movement, in the juice expressed from the tissues; these movements become still more active on the addition of a little distilled water. After cultivation for a few days in the moist cell, these preparations show the same articulated threads found in the blood. The bacilli are brought out with great distinctness by Koch's method of staining, both in fresh sections and in those hardened in absolute alcohol; they take up the staining material readily, and exhibit the same characteristics, as regards distribution, size, &c., as those seen in fresh preparations. With the view of determining the exact specific meaning of the presence of these bacilli, the author has repeatedly endeavoured to convey the disease to rabbits by inoculation, but hitherto without success.—*Cbl. f. d. Med. Wiss.* 8th May, 1880.

24. *Arsenic in Skin Diseases*.—Physiologically arsenic combines with the coloured corpuscles of the blood, prevents them receiving their due amount of oxygen in the lungs, and therefore diminishes oxidation in the tissues and prevents wasting, thus lowering the temperature and lessening the excretion of urea; it renders respiration more easy, probably as the result of the diminished oxidation in the tissues; it seems to lower the blood-pressure, by paralysing the vaso-motor nerves; it produces headache, and eventually paralysis, and thus seems to affect the brain powerfully, probably through the influence it exerts on the blood. Arsenic is eliminated by the skin, mucous membranes, liver, and kidneys. It is extensively used

in cutaneous therapeutics. As regards psoriasis, the author concludes (1) that arsenic sometimes relieves psoriasis in an acute state, sometimes aggravates it, but what are the exact indications for its use, it is, in our present knowledge of the etiology of the disease, impossible to say; (2) it should always be given in small doses for a long period after the eruption has disappeared, to prevent a relapse; (3) it is never necessary during this course to increase the dose so as to produce any physiological effect, such as irritation of the eyes. In lichen planus arsenic is an invaluable remedy; the author has never seen it fail. In acute eczema it is injurious; its good effects in chronic eczema are doubtful. In pemphigus its value is established, but how it acts, whether on the blood or by direct influence on the nervous system, it is difficult to say. Chronic urticaria, the neuralgia so often associated with zoster and acne, are often benefited by a course of arsenic. It must be borne in mind that some patients do not tolerate arsenic; in such cases the different preparations should be tried before abandoning the drug. It should *never* be combined with any other drug, even iron; it should always be taken during or after food; it should never be pushed to produce the slightest constitutional symptoms.—Mr. Malcolm Morris in *The Practitioner*. July, 1880.

25. *Pathological changes in the Skin in a case of Facial Erysipelas.*—The patient whose case is here given had been convalescent from acute articular rheumatism when he was seized with facial erysipelas, complicated by pneumonia, which proved fatal on the fifth day. Sections were made of the skin from the side of the neck, where, at death, the inflammation was at its height, and the following changes were noted:—There was desquamation of the superficial layer of epithelium. The deeper layer was normal, except that in some spots it was loosened from the subjacent papillæ. Papillæ normal; hair follicles and adjacent sebaceous glands showed proliferation of epithelium, and the hair shaft tended to divide just above the pulp. The sweat glands were filled with new cells, and in some places resembled miliary abscesses. Many of the larger vessels in the deeper layers of the skin were thrombosed, but none was seen to contain bacteria. The peri-vascular spaces contained numerous migrated white blood corpuscles, and there was marked cell migration into the tissues round the larger vessels, especially near thrombosed vessels. With thrombosis, near the surface, several haemorrhages had taken place, causing a petechial eruption. There was also a general infiltration of the subcutaneous cellular tissue with new cells, probably

carried thither by the fluid which caused the oedema. At one point the thrombosis had led to necrosis of connective tissue. At a still deeper level, bundles of striped muscular fibres were met with (*platysma*) in the first stage of waxy degeneration, giving a distinct reaction with iodine.—Dr. R. W. Amidon, in *Archives of Dermatology*. April, 1880.

26. *Tinea Imbricata*, or *Tokelau Ringworm*.—Professor M'Call Anderson describes and figures this disease, and the parasite which causes it, in the *Edinburgh Medical Journal* for September. The skin is in a condition not unlike ichthyosis, but the scales are arranged in concentric rings, not in squares, and the affection is associated with heat and intense irritation. Its incubation period, after inoculation, is about nine days. The epidermis is then seen to be slightly raised by a small brown mass (the fungus), which lies between it and the corium; in a short time it gives way in the centre, but as it is still continuous with the sound skin at its margin, it is not completely shed, but remains as a fringe round the central hole. While this ring spreads by its margin, a fresh growth of fungus is seen in the centre, and this in time breaks, and forms another ring of semi-detached epidermis. A never ending series of concentric rings is thus formed. The disease advances over the skin at the rate of $\frac{1}{4}$ inch weekly. It must be distinguished from ordinary ringworm. The latter affection attacks chiefly those parts of the body which are covered by hair, it invades the hair follicles, and seldom involves a surface larger than six inches in diameter; *tinea imbricata* avoids hairy parts, or if it does invade them, does not attack the hair, and may spread till it involves nearly the whole surface of the body. The following table shows the difference in the microscopical appearances in the two diseases:—

Tinea Circinata.

1. Involves the surface of the corium as well as the epidermis.
2. Fungus scanty.
3. Spores very scanty in proportion to mycelium.
4. Spores globular in form.
5. Mycelial threads generally short, with numerous swellings and constrictions, and other irregularities in outline.

Tinea Imbricata.

1. Does not extend deeper than the mucous layer of the epidermis.
2. Fungus present in very great abundance.
3. Chains of spores much more numerous than mycelial threads.
4. Spores about the same size, but oval, rectangular, or irregular; rarely globular.
5. Mycelial threads generally long, straight, or gently curved.

REPORTS OF HOSPITAL AND PRIVATE PRACTICE.**GLASGOW ROYAL INFIRMARY.****REPORTS UNDER THE SUPERVISION OF DR. WILLIAM MUIR.****FROM DR. DUNLOP'S WARDS.**

CASE I. SCIRRUS OF MAMMA—OPERATION. [Reported by E. G. Ochiltree, M.B. and C.M., H. S.] Mrs. B., æt. 50, was admitted into the Royal Infirmary, on 8th October, 1880, complaining of a tumour in her left breast. About ten months ago she was struck on the breast with a large piece of coal. Shortly after this she noticed a small swelling to the outside of the nipple, which grew gradually and was accompanied, especially at night, with severe lancinating pains. On admission there was a hard nodulated tumour in the upper and outer parts of the left mamma. The skin was slightly adherent and puckered; but there was no retraction of the nipple and no enlargement of the axillary glands. The tumour moved freely over the pectoral muscle. At a consultation one of the surgeons said it was non-malignant; but all were agreed as to the necessity of its removal, so Dr. Dunlop excised the mamma, and on section it had all the characters of a scirrhouous tumour, which microscopic examination proved it to be.

The operation was performed with antiseptic precautions, and the incision united by first intention in six days.

CASE II. POPLITEAL ANEURISM—OPERATION.—Wm. H., æt. 36, a strong, healthy looking man, was admitted into the Royal Infirmary, on 28th September, 1880, complaining of a lump at the back of his right knee. Twelve weeks before his admission, while standing at his work, his right foot slipped from under him, and in struggling to save himself from falling he felt as if something had given way in his knee. Ever after this he suffered from dull aching or darting pains at the back of his knee and down the calf of the leg to the toes. For six weeks after slipping he noticed no swelling, but at the end of that time, while walking up a steep hill, he was seized with sudden and very severe pain at the back of his knee. On reaching home he noticed a swelling as large as a hen's egg in the upper and outer part of the popliteal space. As the pain and swelling continued he, after six weeks, sought admission

to the Infirmary. The tumour was distinctly pulsating and firm, and there was a marked *bruit* present. Pressure on the femoral stopped all pulsation in the tumour. No pulsation could be felt in the posterior tibial artery behind the inner malleolus of the affected limb, but in the other it was quite distinct.

The limb was flexed and elevated for some days, and patient kept perfectly at rest and treated with large doses of iodide of potassium, without any abatement of the symptoms. At the suggestion of one of the surgeons at a consultation, tourniquets were applied over the femoral artery, when the tumour diminished considerably in size and became quite soft. After several hours the tourniquets were removed and the tumour immediately regained its former size and firmness and the pain was increased. At a second consultation it was decided that the femoral artery should be ligatured, which was accordingly done on 9th October by Dr. Dunlop, with antiseptic precautions, a strong carbolised catgut ligature being used. The limb was then wrapped in cotton-wool and a hot pan put to the foot. Two and a half hours after the operation his foot was tolerably warm, but patient said "felt as if it were asleep." The leg and toes were very sensitive, causing him severe pain if touched. This lasted for four days, when the feeling of it being asleep and the hyperæsthesia gradually left the leg. Five days after operation he complained of nasty tingling pains deep down in his thigh and all about the knee, especially about the articular branches. The tumour has almost entirely disappeared, and his only complaint, eight days after operation, is the tingling pain about his knee. The incision is almost healed, and the man is in good spirits and feels quite well, with the exception that his leg is a little weak.

FROM DR. MORTON'S WARDS.

STONE IN THE BLADDER—OPERATION. [Reported by Mr. A. H. Guest, House Surgeon.] Thos. Cairns, miner, æt. 38, was admitted to the Royal Infirmary, on 13th September, 1880, suffering from symptoms of stone in the bladder of seventeen years' duration. Dr. Morton, having satisfied himself of the existence of stone, performed on 1st October the lateral operation of lithotomy, and extracted a dumb-bell shaped stone weighing two ounces. A lithotomy tube was used for the first twenty-four hours after the operation. In five days after the extraction of the stone he passed urine by the urethra. The temperature for the first five days was normal, it then rose a

degree for two or three days; but since the twelfth day from operation his temperature has been normal. The wound is now nearly healed, and most of the urine passes by the urethra. Chemical examination of the stone showed it to be composed of oxalate of lime.

WESTERN INFIRMARY.

REPORTS UNDER THE SUPERVISION OF DR. W. G. DUN.

FROM DR. M'CALL ANDERSON'S WARDS.

(Temporarily under the Care of DR. JOSEPH COATS.)

SUDDEN DYSPNEA FROM PNEUMOTHORAX IN CASE OF COMPARATIVE HEALTH PREVIOUSLY—SUDDEN DEATH. [Reported by David L. Inglis, M.B.]—J. L., aged 35, was admitted 5th October, 1880, in a state of extreme dyspnoea, with very severe cough, and expectoration of greenish-yellow, very tenacious sputum. During the whole of the past summer he had been suffering more or less from cough, with yellowish expectoration; but had always been quite able to attend to his duty, which was that of mate on the steamer "Brodick Castle." During the whole time that he was troubled with the cough there was no appreciable loss of strength or flesh, and on admission he presented the appearance of a fairly healthy and very well nourished man.

On inquiry, it was found that on Tuesday, 30th September, a week before admission, he was in his usual state of health, and that next morning he felt nothing wrong till after breakfast, when his breath began to become short, so much so, that he had, in steering the vessel, asked a man to "stand by" the wheel to relieve him of the exertion of turning it. During the day the breathlessness increased, but for that and the following night he was still able to lie down in bed. Ever since then, however, he has been obliged to sit up. After the onset of dyspnoea, the cough became much more severe.

On examining the chest, it was seen that the right mammary region was somewhat fuller than the left, and on placing the hand over the projection, slight crepitation, as if from subcutaneous emphysema, was discovered.

All over the right side of the chest the percussion note was decidedly clearer than on the left, where a comparatively dull note was elicited in the lateral region, though that over the apex was quite clear. The respiratory murmur, except toward the root of the lung behind, was entirely absent on the right

side, and on the left, puerile, with occasional moist râles, and with a certain degree of tubularity toward the lateral region. Vocal resonance, on the left, was generally louder than on the right, but not markedly so. The "bell sound" was distinctly audible over the right side, but there was nothing of the kind on the left. The left side of chest measured $18\frac{1}{2}$ inches, and the right $19\frac{1}{2}$ inches.

The liver was not remarkably depressed, but owing to the state of the patient, this, with other minutiae of examination, was not pushed. The face and surface of the body generally at the time of examination were of a dusky livid hue.

To aid in the expectoration of the viscid sputa, patient was ordered to have a stimulating expectorant, and was placed in a room, the air of which was kept loaded with steam. This treatment had the effect of at first diminishing the dyspnoea, but it was temporary. The dyspnoea and lividity rapidly increased, and the patient died suddenly on the 8th of October. Unfortunately, the friends refused to allow a *post-mortem* examination.

Remarks.—The exact pathology of this case, in the absence of a *post-mortem* examination, must remain obscure, but the sudden onset of a pneumo-thorax in a previously healthy man is sufficiently striking. In view of the urgent dyspnoea the question of paracentesis in order to let out some of the air in the pleural cavity was considered, and Dr. Coats had given directions that he should be sent for if the dyspnoea became aggravated. The death, however, occurred without any previous aggravation of the dyspnoea, and was so sudden that when Dr. Inglis, the resident physician, who was sent for at once, arrived, the patient was already dead.

CASE I.—TWO CASES OF OLD PLEURISY WITH RETRACTION OF SIDE AND DISPLACEMENT OF HEART, WITHOUT PRONOUNCED PREVIOUS SYMPTOMS OF PLEURISY. [Reported by David Inglis, M.B.]—J. S., admitted 28th September, 1880, complaining of dyspnoea on exertion, and of pain, and a feeling of tightness in the lower part of the thorax. No distinct history of any pulmonary affection could be elicited from the patient, his statement being that up till nine months ago he had always enjoyed excellent health, and that at that time he began to complain of a stitch like pain in the lower parts of both sides of the chest. This pain, which was on the whole more pronounced on the right side, was never very severe, and was removed by blisters, but more or less shortness of breath remained.

This shortness of breath became aggravated about four months ago, and at the same time various abnormal sensations referred to the chest, made their appearance, generally taking the form of a sense of weight, or bruising of the chest walls. On one or two occasions, at long intervals, he has had attacks of palpitation, but this does not appear to have any connection with the attacks of dyspncea, which are always caused by any slight over-exertion.

Inspection of the chest showed in front an obvious flattening of the right side of the chest wall, and behind distinct curvature of the vertebrae, with the convexity to the right. The right side measured 16 inches and the left $17\frac{1}{4}$ inches.

On percussion a marked difference was observed between the notes given by the right and left sides, the former being comparatively dull and the latter highly resonant, and this resonance was distinctly traceable for $\frac{1}{4}$ inch beyond the middle line. The area of cardiac dulness had undergone a remarkable displacement. It was at first sight as if the organ were on the right side instead of the left; an extensive area of dulness occupied nearly the position on the right side that the normal area does on the left. In the usual position of the cardiac dulness the note was mostly clear and even, like the rest of the chest, hyper-resonant, but towards the middle line it became dull to light percussion.

When patient lay over to the left side a considerable alteration in the position of this dulness was observed. The left margin shifted considerably to the left, and the right margin, at its upper part, passed across the middle line, the change being less in the lower part.

The cardiac sounds were loudly audible over the whole of the right side, the second sound being exaggerated at the upper part. Respiratory murmur over the entire right side, in front and behind, was rather feeble, but nowhere absent. Expiration was somewhat prolonged, but no râles were discoverable. Vocal resonance was much exaggerated, and percussion was unsatisfactory both in front and behind.

CASE II.—J. W., aged 21, painter, was admitted 13th October, 1880, suffering from diabetes mellitus, but for the present this condition will be left out of account. On examining the chest a curious condition of the cardiac dulness was discovered. The left edge was found to be $1\frac{3}{4}$ inches inside the nipple, and $2\frac{3}{4}$ inches from the middle line. The right edge presented a very great divergence from the normal, passing $\frac{1}{4}$ inside the right nipple to a point an inch below it,

where the divergence was still more marked. At the point where it began to merge into the hepatic dulness the right edge was found to be $4\frac{1}{2}$ inches to the right of the middle line. The area of cardiac dulness measured $5\frac{1}{2}$ inches in its total transverse diameter. No distinct apex beat could be detected, but the sounds were heard with greatest distinctness at the lower part of the sternum, the intensity diminishing on passing to either side, but more rapidly on passing to the left.

The pulmonary percussion note was distinctly higher in pitch on the right side than on the left, both in front and behind. In addition, there was dulness at the right base. On the right side, in front, the respiratory murmur was considerably more feeble than on the left, where it might almost be said to be slightly puerile. Behind, this difference was not so appreciable. At the right base, the respiratory murmur was accompanied by abundant subcrepitant râles, and at one or two points a distinct to and fro friction sound was heard.

On inspection of the chest, slight flattening was visible on the right side, and it was found that, on an average, the measurements of the left exceeded those of the right side by from $\frac{1}{2}$ to $\frac{3}{4}$ of an inch, measurement at the level of the nipple being, left 17, right 16 $\frac{1}{4}$.

On inquiry, no history can be obtained of any serious illness till the onset of the present attack of diabetes, but it was stated by the patient that he had been subject to shortness of breath "ever since he could mind," though never to such an extent as to be a prominent symptom or to incapacitate him from work.

Remarks.—These two cases are interesting in respect that they show the signs of an old pleurisy with contraction of the right side of the chest and very marked displacement of the heart without any previous history of a severe acute pleurisy. In the first case the impression conveyed by the patient is that he has had no serious illness up to the present time, and that if it were not for the shortness of breath he would consider himself well enough. In the second case the patient does not recognise that he is any worse in regard to shortness of breath than he ever was, and there is not a trace of a history of an acute attack, nor is there, at present, any expectoration or other pulmonary symptom.

FROM PROFESSOR GEORGE BUCHANAN'S WARDS.

HÆMORRHAGIC DIATHESIS—PROTRACTED HÆMORRHAGE AFTER EXTRACTION OF A TOOTH—APPLICATION OF ACTUAL CAUTERY, AND SUBSEQUENT USE OF ERGOTINE SUBCUTANEOUSLY.—The

patient, a young man, aged 24, presents a strikingly anaemic appearance, and is so debilitated by protracted haemorrhage, that he is quite confined to bed, becoming giddy if he sits up even for a short time. Four years ago he was admitted to the hospital on account of continued haemorrhage following the extraction of a tooth. The actual cautery was used on that occasion, and after a short residence he was dismissed apparently quite well. A few days later, however, a return of the haemorrhage occurred. Plugging with lint and perchloride of iron was resorted to, and it finally ceased. The account of the present occurrence is that; on the 29th of August last, he had one of the upper left molars extracted by a dentist, to whom no mention was made of the previous troublesome haemorrhage; blood continuing to flow, a plug of lint and matico was applied, but with no very good effect. The plugs were renewed at intervals for a week, but failed thoroughly to control the haemorrhage. The patient then consulted Dr. Donald M'Phail, who, on 5th September, cauterised the bleeding surface, and plugged the cavity. This procedure appeared at the time successful, but on the same night oozing took place through the plug, and two days later the haemorrhage became more active, and continued intermittently for a week, when it stopped spontaneously. After two days it again commenced; a gutta percha plug was now applied, and with good effect, but the gum by this time had become so tender, that the patient could not endure the necessary pressure, and he was therefore advised to enter the hospital, which he accordingly did on 18th September. On the 21st, chloroform was administered, and Professor Buchanan removed the adjacent tooth and some dead bone in the neighbourhood of the bleeding. The antrum of Highmore, which contained a considerable quantity of fetid pus, was then opened, a thick pyogenic membrane scraped out, the actual cautery applied, and the antrum stuffed with lint. In spite, however, of this very thorough treatment, the bleeding returned on the 26th, but was easily controlled by re-stuffing the antrum. On the 30th it again recurred. At this date subcutaneous injection of ergotine was begun, 4 grs. being administered three times daily as a rule, for about ten days, and afterwards less frequently. This appears to have had a good effect, as up to the date of writing (14th October) there has been no return of the haemorrhage. During this period the plug was allowed to remain in the antrum, but ultimately it softened, and came away in shreds.

Remarks.—This is a good example of the haemorrhagic

diathesis, a condition fortunately rare. It is obvious, from the history, that the haemorrhage resulted from a softened state of the gums, and not from any injury to the alveolus during extraction. The case is the more interesting from the fact of profuse haemorrhage having twice occurred. The patient was in ordinarily good health on both occasions, and the only instance of a similar haemorrhagic tendency in his family of which he is aware was in his grandfather, who sometimes bled very freely from the gums, even when there was no wound.

DOUBLE HARELIP WITH CLEFT PALATE.—M. T., æt. 4 months, admitted on 1st September, suffering from double harelip and prominent intermaxillary bone and cleft palate.

Sept. 3rd.—Dr. Renton operated by the method recommended by Professor G. Buchanan—viz., by removing a small wedge from the posterior surface of the intermaxillary bone, breaking it and attaching its sawed edges to the edges of the cleft maxilla by means of strong silver wire passed through the different points. The cleft lip was then united along with the skin over the intermaxillary bone.

Sept. 10th.—The lip has healed and the main stitches were removed, a piece of sticking plaster being applied to give support to the parts. The child was dismissed.

Oct. 10th.—The child was brought to the Infirmary to-day and the result is quite satisfactory.

Remarks.—By retaining the intermaxillary bone as recommended by Professor G. Buchanan, a much better result is obtained. In the present case a small wedge was sufficient to enable the bone to be broken into position, but sometimes a considerable portion requires removal.

CHRONIC LYMPHANGITIS WITH ULCERATION OF FOOT, ANKLE, AND LEG—AMPUTATION—RECOVERY.—T. M., æt. 17, was admitted on 3rd August, suffering from an ulcerated and hypertrophied condition of the tissues of his left leg, ankle, and foot, which had existed for three years. It commenced after an injury to his toe, and after repeated attacks of lymphangitis, with consequent swelling of the limb, ulceration commenced and he became unable to move about. Eighteen months ago, Dr. Renton had seen the case in consultation with Dr. Beatson, and the swelling and hypertrophy of the skin and other tissues seemed to indicate a form of elephantiasis. Since the ulceration commenced the swelling has increased, and the affected limb measured 3 inches more round instep, ankle, and calf than the right.

After consultation amputation was determined upon, and on

7th August, Dr. Renton performed the operation, amputating at the knee.

Aug. 9th.—Slight attack of lymphangitis, which subsided under iron and good diet.

The stump gradually healed and the patient was dismissed on 5th October.

Remarks.—Dr. Beatson had employed various internal remedies along with rest and the application of Martin's elastic bandage, but no appreciable improvement followed, so that with his approval the patient was admitted to the Infirmary.

The questions which naturally arose were, Was this condition elephantiasis? The absence of the great thickening of the epidermis as seen in typical cases of Barbadoes leg, along with the greater amount of muscular movement were against this view. Was it purely due to repeated attacks of lymphangitis, resulting in ulceration of the tissues of the foot, ankle, and leg? The absence of any history of syphilis, congenital or acquired, leads us to take this view of the case, although it was evident from the persistency of the ulceration and the repeated inflammatory attacks that there was some constitutional cause preventing a healthy action in the limb. That cause might have been syphilitic or tubercular.

Owing to the depth of the ulcerations, their long standing, the weight and consequent uselessness of the limb, amputation was decided on.

EPITHELIOMATOUS ULCER ON RIGHT THIGH—AMPUTATION—RECOVERY.—E. D., æt. 56, was admitted on 21st August, suffering from a large epitheliomatous ulcer on the outer side of the right leg and extending three inches above and below the knee joint. It had existed for seven years in the cicatrix of a large burn which extends three inches above the ulcer on the outer side and posteriorly. No glandular enlargement in the groin.

Sept. 1st.—Dr. Renton amputated the limb through the upper third of the thigh.

Oct. 10th.—The case progressed favourably, and there only remains a small portion of the stump unhealed.

Remarks.—This case illustrates the fact that epithelioma is apt to occur where the tissues have undergone a certain amount of change, and patients suffering from this particular form of cancer can more generally give some account of an injury as the starting point of their disease. In this case there had existed for twenty years a large cicatrix, and in that cicatrix the epithelioma commenced, according to the patient's statement, seven years ago. This is certainly a long time for

epithelial cancer to exist, although from time to time we do meet with cases in which the disease has advanced very slowly, and this occurs more frequently in the lower extremity. The case was a serious one, as amputation had to be performed in the upper third of the thigh.

EXCISION OF THE KNEE-JOINT.—E. M., æt. 9, was admitted to the Western Infirmary on July 13th, suffering from synovial disease, with ulceration of the cartilages of the left knee-joint, the tibia being dislocated backwards, and the slightest movement causing pain.

Aug. 3rd.—Dr. Renton, who had charge of Professor G. Buchanan's wards during his absence, excised the knee-joint in the usual manner, removing the patella and thin slices from the femur and tibia. An abscess extended for two inches upwards on the inner side of the femur, the interior of which was evacuated, scraped, and chloride of zinc solution applied to it, as also to all the cut surfaces; two horse hair drains were employed, one being placed posterior to the bones, and the other anterior to them, the ends being carried to the angles of the incision, which insured thorough drainage. Lister's antiseptic dressings were applied, and the limb fixed in the plaster of Paris case recommended by Dr. Heron Watson.

Aug. 27th.—The site of operation is quite healed, and the drains were removed. There has been no elevation of temperature, no pain, and no discharge, except a little serum.

Sept. 10th.—The union of tibia and femur is firm, and as no dressings are now required, the limb was fixed in plaster of Paris, and the patient allowed to move about a little.

Sept. 29th.—Patient dismissed with directions to return and show herself.

Oct. 12th.—Continues to progress favourably, and walks well.

Remarks.—This case was a favourable one for excision of the knee-joint, even in so young a girl, for although the synovial disease was considerable, the amount of ulceration of the cartilages was not very extensive, and the bone removed was consequently limited, so that we hope that a useful limb may have been saved to the patient. Healing took place by the first intention, so that we were successful in carrying out Lister's antiseptic recommendations; for some days there was considerable tension over the site of the old abscess, but the horse hair drains were sufficient to prevent that tension rising to the point where suppuration commences. The splint used proved perfectly satisfactory, and contributed a great deal to the good result in maintaining absolute fixture of the limb.

MEETINGS OF SOCIETIES.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.

SESSION 1879-80.

MEETING VI.—20TH FEBRUARY, 1880.

DR. FERGUS, *President, in the Chair.*

DR. CHARTERIS related a case of HYDROPHOBIA which had been treated by him in the Royal Infirmary. He said—"Pilocarpin was the remedy employed in this case, and it was at one time hoped that the trial would have justified its selection; for the patient was a muscular athlete, tall, strong, and wiry, whose constitution was unimpaired by previous illness, and who had, as he said, 'neither tasted drink nor smoked tobacco in his life.' The drug lowered the temperature, promoted copious salivation and perspiration, and strange to say, the inability to swallow was entirely removed, and the gloominess that hung over the patient at first was succeeded by wild bursts of delirious joy, with fanciful pictures of happiness and peace. The struggle, fierce and terribly violent, which lasted four days, seemed to exhaust the man, and without convulsions and without terror he sank and died.

"The clinical record of this case, after it had been decided to try pilocarpin, is as follows:—At 9·45 A.M., when first seen, his pulse was 150 and his temperature 102·6°. One-third of a grain of pilocarpin was injected, and in about three minutes afterwards he began to hawk and spit profusely, and this was followed by a copious perspiration. At 11·15 the injection was repeated, causing the same symptoms, and when seen at 12, he was lying comparatively quiet, and 'sweating awfully,' as he said. His temperature had fallen to 101°, fully a degree and a half, his pulse being 140 at 2 P.M., and the reduction of temperature was more noted, as it was 100°, and his pulse was 130. At 4 P.M. he complained of severe pain in the back of his head, for which a poultice was applied. He now asked for a drink of milk. The nurse steadied his hand, and assisted him to bring the cup to his head; when it was there, he threw the milk into his mouth as a man might do a pill, and swallowed it with a great gulp. After he had done this, he rose to his full height in bed and said, 'I have swallowed at last. I am a cured man. I'll go

home to-morrow; but don't mind me, don't mind me, when I get out.' Everything was done to foster the idea that he was getting better, and he promised money and the eternal gratitude of himself and family, adding, 'The Vale of Leven will wonder when they see me back a cured man.' At 6 P.M. pilocarpin was repeated, but the result was not the same as before, for little perspiration was induced, but instead, copious micturition. His temperature had again risen to 102°, and his pulse was 160. At 9 P.M. his condition with regard to temperature and pulse was unaltered, and he talked incessantly. Bromide of potassium was given in large doses, but no sleep was obtained. At 9 A.M., when again seen, he said he had not slept, for men had come in and sat on him, bruising him much all down the back. His temperature was 102°. Pilocarpin was again injected, but little perspiration was induced. At 12, three hours afterwards, pain was experienced over the kidney, and a trace of albumen detected in the urine. He saw his wife at his own request, and to show her he was better, he took some milk with an effort, but no particular spasm. He had taken in all, since his amendment, two pots of Brand's essence of beef. At 4 P.M. the nurse stated he had dosed about ten minutes at a time, but he had had no sound sleep. He appeared much excited about being beaten. Later on he slept about an hour, after having an egg beat up with brandy, and on awakening he took a slice of bread soaked in water and some essence of beef. During the remainder of the day and the following morning he was simply exhausted through constant talking and want of sleep, but he could swallow easily. At 9 A.M. he wished to go out, and actually reached the door, but was persuaded to return. His exhaustion was very intense, and the albumen in the urine very abundant. At noon of the same day he died."

DR. FOULIS and DR. COATS showed MICROSCOPIC PREPARATIONS ILLUSTRATIVE OF THE PATHOLOGY OF THE DISEASE.

Dr. Morton, on the part of Dr. Antony Milroy, Kilwinning, also related a case which had been treated by the latter, and which appears at p. 379.

DR. WHITTAKER showed PREPARED SECTIONS OF THE SPINAL CORD of Dr. Charteris' case, including one section low down in the canal. When put in spirits, the noticeable thing was the enormous quantity of crystals of phosphates deposited in the liquor. Along with crystals of the ordinary prismatic form, there were a number of needle shaped ones. The former, as was usual, in the course of a few days, began to change into the feathery shape. The sections of the cord which he had

examined showed great disorganisation. At the *post-mortem* examination, at which he was present, he noticed the great injection of the spinal cord, the vessels being plain to the naked eye. Leucocytes in considerable quantity had passed through the walls of the vessels. He had compared the microscopical appearances with those in a case of delirium tremens, and in a case of opium poisoning after long drinking. The appearances in all these cases were similar in kind, but in the hydrophobia case the disorganisation was greatest.

Dr. Coats said that by the courtesy of Dr. Foulis he was present at the *post-mortem* examination, and had also opportunities of examining microscopically the nervous centres, especially the medulla oblongata. The chief pathological appearance was the great accumulation of leucocytes outside the walls of the vessels. The view he took of this lesion was that it was not specially peculiar to hydrophobia; but that the existence of these leucocytes was evidence of some intense irritation of the central nervous system by contagium. If this were the case it would be natural to expect evidence of irritation in other organs. The first structure they naturally turned to was the salivary glands. In two dogs which had had the disease he had evidence in these glands of irritation very much like what he found in the nervous system. Round the vessels he found multitudes of leucocytes placed between the proper substance of the gland. There were also signs of engorgement of the veins. In the kidneys he found enormous engorgement of the venous system, and infiltration of the kidney with leucocytes. In the liver there were leucocytes in the interstitial tissue, and in one of them an interstitial hepatitis, which, however, was not connected with hydrophobia. The dog was, in fact, the subject of hepatic cirrhosis. In regard to the present case, he had placed under the microscope sections showing the lesions in the central nervous system, as described by Benedikt, Gowers, and himself. In the salivary glands there had been a considerable exudation of leucocytes, and these were accumulated in the interstitial tissue and in the neighbourhood of the veins. In the kidneys there were various lesions, and the same engorgement of the venous system which he had seen in the dogs, though in the case of the latter the mode of death may have had something to do in its production. Besides this, there was a certain parenchymatous inflammation of the kidney, and a certain superabundance of leucocytes in the tissue of the kidney. The man was, in fact, the subject of a slight old inflammation of the tissue. To the mere presence of leucocytes in the kidney not much weight

was therefore to be attached. There were also tube casts in the kidney. In the liver there were signs of irritation in the presence of leucocytes round the vessels, especially round the smaller vessels. To bring the pathology of the disease into a consistent condition, he might put it this way. That there was an irritant in the blood, which attacked a considerable number of organs, the signs of irritation being most manifest in the neighbourhood of the finer blood-vessels; that it was probable that this irritant attacked some vessels more than others, especially those of the central nervous system. That in the nervous system the medulla oblongata and spinal cord were most the subject of the lesion, which scarcely showed itself in the higher centres. It was impossible to hear of the clinical symptoms, as they had been described that evening, without thinking of these lesions in the nervous centres; the difficulty of swallowing, the respiratory symptoms, &c. In regard to the spinal cord, he had seen nothing of what had been spoken to by Whittaker—viz., a complete disorganisation of structure. He was inclined to think that the specimens submitted to Dr. Whittaker had been kept too long, or possibly put into a too concentrated solution of chromic acid.

Mr. John Reid doubted whether these fine spun pathological subtleties tended much to profit or enlightenment. They simply proved, after all, that hydrophobia was a disease attended with very great excitement, as shown by a considerable hyperæmia in many of the organs. The sudden appearance of albumen in the urine showed that the disease was of an inflammatory nature. Keeping this in view, what was the object in injecting hypodermically these drugs of the nature of narcotics? He would have put the man under strict antiphlogistic treatment. He believed that Cooper, in his *Surgical Dictionary*, mentioned a case in which cure had been effected by this treatment. Bromide of potash, which by the way was an old remedy described in Ure's *Dictionary*, was now-a-days administered in all kinds of diseases, from infantile convulsions to hydrophobia. He had tried it so far back as 1833, and believed that its action was always prejudicial. Recent trials of it had only confirmed him in this opinion. The cauterising of a dog bite he considered also an absurd mode of treatment. The formation of a thin pellicle of cauterised tissue over the wound was much more likely to fix the virus in it, than to tend to its elimination. He would simply poultice the wound.

Dr. Whittaker pointed out some features of interest in this case. One was that the clinical symptoms and pathological appearances were scarcely distinguishable from those of delir-

ium tremens. Another point was the marked aversion to cold; and it might turn out that the proverbial aversion to water was resolvable into an aversion to cold. In the present case the wife had sucked the wound, and up to this time she showed no signs of hydrophobia. This showed that the virus was akin to the poison from the fang of a serpent. He suggested that the authorities should be memorialised to take steps to place dogs under stricter surveillance.

Dr. Morton said that it was evident that, up to this time, pathological research had thrown no light on the essential nature of the disease. The lesions discovered were not pathognomonic of hydrophobia. It might turn out that pathological chemistry might give them some knowledge on the matter. Might it not be that phosphorus, which was found throughout the nervous system, had something to do with it? In the former cases of hydrophobia in this city there had been considerably less delirium than in the present case. The rise of temperature was noticeable; and in Dr. Milroy's case, the tumultuous action of the heart coincidently with a moderate pulse.

Dr. Fleming said that when a virus was instilled into the system there were two courses open to them—either to attempt to introduce an antagonistic agent or antidote, or to endeavour to enable the patient to survive till the natural emunctories of the system should enable him to throw off the virus. No absolute antidote to the poison of hydrophobia had yet been discovered. But there was one drug which, as far as they could judge from its physiological effects, would tend to combat the action of the virus. That was *curari*. It had been tried, but without success. The reason of the failure was that *curari* was a poison with effects worse than the disease. The cause of death was paralysis of the muscles of respiration. Now, what he would suggest would be that attempts should be made to perfect mechanical arrangements by which the patient might be kept alive by artificial respiration. The proposal might strike them at first as of the nature of heroic remedies. But the disease was certainly desperate. If *curari* was found to counteract the poison of hydrophobia, he did not see any insuperable obstacle to keeping the patient alive while under *curari* by means of artificial respiration, and thus tiding him over till the poison was eliminated.

Dr. Coats pointed out that there was no known means of applying artificial respiration in the human subject.

Dr. Newman also pointed out difficulties in regard to the treatment suggested by *Dr. Fleming*.

Dr. Thomson suggested that the congestion noticed in the kidney arose from an effort to eliminate the poison by that organ. In other affections, such as diphtheria, scarlatina, &c., the specific poison was eliminated by certain organs which were different in each case. But in hydrophobia there appeared to be no special arrangement by which the system could throw out the virus.

M E D I C A L I T E M S.

UNDER THE DIRECTION OF

ALEX. NAPIER, M.D.

Milk Diet in Diseases of the Heart.—Dr. Potain read a paper lately on this subject before the Congress at Rheims. It has attracted considerable attention and has been published in several continental journals. We take the following summary from the *Journal de Thérapeutique*, 10th Sept., 1880. In order to obviate the disappointing results referred to by many who have tried this treatment in heart diseases generally, the author would divide such affections into four groups. (1.) Organic diseases of the heart. These, he says, are obviously quite unsuited for this treatment. Nor can it be of special value in (2) the various forms of nervous derangements of that organ. In (3) acute inflammations of the heart and its membranes, this treatment, as in all acute inflammations, is worthy of consideration. But he does not think it of specific value, except possibly in hydropericardium, where it may be of some service as a diuretic. (4.) This group includes simple hypertrophy of the heart (*i.e.*, without valvular disease) of secondary origin. For this class of cases the treatment is peculiarly suitable. If the cardiac affection is dependant on renal disease (parenchymatous nephritis) we may expect the treatment to be very efficacious. Dilatation of the right heart dependent, as he believes it often is, on gastro-hepatic disorders (causing a reflex contraction and therefore increase of tension of the pulmonary vessels) is also likely to be benefited by milk diet, but particularly if it is of gastric origin. But he considers it absolutely necessary that milk be exclusively given. He has had patients who were able for quite a good day's work over a long period on that diet alone. It is essential, of course, that it should be digested and assimilated. In some cases it might

be necessary to add a little pancreatin or other digestive ferment to aid its digestion.—J. W. A.

Antipyretic Properties of Hydroquinone and Resorcin.—Some time ago, Dr. L. Brieger showed that the above named bodies, together with pyrocatechin, all of which are isomeric with each other, possess antifermentative and toxic properties. As antifermentative and antipyretic properties usually go hand in hand, the author instituted a series of experiments, which all tend to show that hydroquinone and resorcin possess the power of lowering the temperature to a considerable extent. Pyrocatechin was not tried, being too powerful a poison. The patients experimented on suffered from pneumonia, typhoid fever, and the hectic fever of pulmonary phthisis. The dose of resorcin given varied from 1·5 to 3 grammes. Its effect was to diminish all the febrile symptoms within an hour; in a few minutes giddiness was produced, followed by noises in the ears, acceleration of respiration, flushing of the face, profuse sweating, and a fall in the temperature amounting to 2-3° C. The pulse also became slower. These effects lasted but a short time; in 2-3 hours the temperature rose to its former point. The general condition of the patients was not improved; there was rather a disposition to collapse, which usually necessitated the administration of powerful stimulants. Hydroquinone acted equally promptly, but more powerfully, a smaller dose, 0·2-1·0 gramme, sufficing to produce the same results. Much the same symptoms followed its use. It had the advantage, however, that the dose required to effect a fall in the temperature was in most cases so minute as to be accompanied by no deleterious action. It is also extremely soluble and non-irritant, and is thus well adapted for subcutaneous injection; these properties are the more important as we have at present no other remedy that can be used in that way, when patients suffering from very high fever can neither swallow nor retain rectal injections. The author has never seen it cause abscess when injected under the skin; he recommends a 10 per cent solution, of which he injects two Pravaz' syringefuls. This will reduce the temperature 2° C. within an hour, and the pulse rate by one-third; the antifebrile action is brief, however, and in one hour and a half pulse and temperature will usually be found to have again reached the fever point.—*Cbl. f. d. Med. Wissensch.* 11th September, 1880.

Resorcin and its Therapeutic Uses.—Dr. Justus Andeer, of Würzburg, has just published a pamphlet on the above

subject, of which a *résumé* is given in *New Remedies* for September and October. As indicated in the preceding *Item*, resorcin belongs to the dihydroxylbenzol series, which also includes pyrocatechin and hydroquinone; these three substances are isomeric, having the same chemical composition, $C_6H_4(OH)_2$, yet they are chemically quite different. Resorcin is extremely soluble in all liquids, except carbon disulphide and chloroform; its odour resembles that of phenol, and its taste is sweetish-bitter. It coagulates albumen. Its evident close relationship to phenol (carbolic acid), from which it differs but very slightly in chemical composition, led the author to conjecture that it might possess the antiseptic properties of that substance. Subsequent experiments justified this supposition. A strong solution of resorcin arrests fermentation; a 1 per cent solution prevents the decomposition of urine, and is an energetic destroyer of the organic germs of putrefaction. It is not absorbed by, nor does it irritate, the sound skin. Hypodermic injections of a 2 per cent solution produce no reflex symptoms in fat and well nourished persons, but in lean and nervous subjects painful cramps and twitchings are observed. No abscess has ever been noticed. Applied to the lips it produces no effect so long as they are dry, but if they are wet a white blister is raised. Wounds artificially made in animals, if treated with a 1 per cent solution, invariably healed by first intention; wounds of mucous membranes, after being cauterised with resorcin, heal quickly, without the development of pathogenous germs or bacteria below the scab. Cutaneous abscesses and erysipelas yield to treatment with resorcin often in two or three days. The drug is better borne than any other antiseptic, particularly by the lungs, which it does not in the least irritate. It is valuable as a caustic for catarrhal, tubercular, or syphilitic sores; here it is best used in the form of crystals applied to excrescences, particularly on mucous membranes. In powder or crystal the author states that it is a most effective remedy in diphtheritic affections; he says that *the most severe cases were cured in one week completely and with no injurious consequences; there were no failures.* The usual dose for an adult, in mild cases, and at the beginning of severe cases, is 15-30 grains, in severer cases 45-75 grains, dissolved in about $3\frac{1}{4}$ fl. oz. of water. These doses may be divided and taken at intervals during the day, as a preventive against toxic influences. For exhibition in fluid forms the best vehicles are alcohol, glycerine, and syrup of orange; but it is best taken in powder inclosed in wafer or gelatine capsules.

Picric Acid as a Test for Albumen.—In the August number of this *Journal* (p. 168), the detection and estimation of albumen in the urine by Esbach's solution of picric acid was described as a very delicate and reliable method of testing. Dr. F. P. Kuthe announces that, if the patient is taking quinine, a large part of which is eliminated by the kidneys, the addition of picric acid to the urine produces an abundant precipitate of picrate of quinine; this precipitate, however, is soluble on boiling the liquid, while the picrate of albumen remains perfectly insoluble. Such a source of error must be borne in mind in employing this test.—*Bull. Gén. de Thérap.* 15th October, 1880.

Preventive Inoculation of Malignant Pustule.—At a meeting of the Académie de Médecine, held on 20th September, M. Bouley read a remarkable communication, giving the results of some experiments made on sheep, to determine the value of M. Toussaint's method of inoculation, which was described in the last number of this *Journal*, p. 342. 20 sheep were inoculated with the modified *charbon* virus; of these 4 died in a few days, the remainder survived. These 16 sheep were then repeatedly inoculated with active and unmodified virus, with the result that they resisted it perfectly and suffered in no respect from the operation. It remains to be seen whether they can resist the natural method of inoculation, that is, whether they would escape if set to pasture in *les places maudites*, localities in which the disease is known to be rife. M. Bouley adds the interesting statement that he considers it probable that this immunity is transmitted to lambs born of inoculated sheep. If these results are confirmed they will prove of the utmost importance.—*Bull. Gén. de Thérap.* 15th October, 1880.

The Effect of Heat on Absorption.—By N. Saszezky. (*Petersb. Med. Woch.* Nos. 14-19. 1880.)—Iodide of potassium, salicylate of soda, ferrocyanide of potassium, and quinine were administered by mouth, rectum, and subcutaneously, to patients suffering from fever, and to the same patients after the fever had subsided; the urine, and, in the case of those taking iodide of potassium, the saliva, were then carefully examined to determine the time at which elimination by these channels first began. In 29 out of 32 cases these substances were detected in the secretions 6-20 minutes sooner during the fever than afterwards, in 3 cases 3-12 minutes later than in the non-febrile condition. Of these three cases, one was

a phthisical, and another a typhus, patient, to whom the ferrocyanide of potassium had been given by the rectum, while the third was a consumptive patient who had taken iodide of potassium by the mouth. The greater rapidity of absorption during fever is said by the author to be due (1.) to the greater rapidity of the heart's action and of the circulation, (2.) to the more active tissue-change which goes on in febrile conditions, and (3.) to the fact that osmosis goes on more quickly the higher the temperature. The same substances, first heated to 36-40° C., and on a subsequent occasion cooled to 6° C., were given to persons in good health and free from fever, when it was found that elimination of the warm preparations began 2-40 minutes sooner than that of the cold preparations; injected under the skin also, the warm solutions were detected in the secretions sooner than the cold in 10 out of 15 cases. It was also found that if the portion of skin at which subcutaneous injections were made were first of all warmed with hot water compresses, the specific effects of the substances used (morphia and pilocarpine) were noticed sooner than when the skin was previously cooled.—*Obl. f. d. Med. Wiss.* 18th September, 1880.

Treatment of Aural Polypi.—Politzer recommends rectified spirit of wine as the best remedy for polypus or granular growths in the outer or middle ear, as more certain in action, and involving fewer disadvantages than solutions of acetate of lead, muriate of iron, &c., so commonly used. The ear must first be cleared of secretion by injection with luke-warm water; if there be suppuration of the middle ear the Eustachian tube must be inflated to drive the pus into the external meatus. The parts should then be carefully dried. The head is then to be turned over to one side, and a teaspoonful of slightly warmed spirit poured into the ear, where it is to be allowed to remain 10-15 minutes. This is done three times daily. The spirit produces a slight burning sensation in the ear; if acute pain be excited, weaker solutions must at first be used, then the stronger preparation. The alcohol first whitens the granulations by coagulating the mucus which lies on the surface; it subsequently penetrates the tissues, produces coagulation in the vessels, and so leads to the shrinking of the new formations. The time occupied by the treatment varies from a few days to several weeks, occasionally months. The soft, round-cell polypi yield most rapidly, the firm, fibrous kind more slowly; nevertheless, many, even of

the latter variety, disappear completely, and leave no trace behind. Politzer has used alcohol in the above way for two years, and gives the following as the conditions in which it will be found most useful :—

1. In the treatment of the remains of polypi, which cannot be removed by operative means, and which are situated in the outer auditory meatus, on the membrana tympani, or more particularly in the tympanic cavity.
2. In cases of multiple granulations in the external ear, and on the membrana tympani.
3. In cases of diffuse hypertrophy of the mucous membrane of the middle ear.
4. In cases in which the removal of the growths by instruments is prevented by mechanical obstacles in the external meatus.
5. In the treatment of children and nervous patients, in whom an operation could be undertaken only with the aid of anaesthetics.
6. In otitis mycosa.—(*Wiener Med. Wochenschr.* No. 31. 1880.) *Cbl. f. Chir.* No. 40. 1880.

Eucalyptus Oil in Antiseptic Dressings.—Dr. Siegen writes very favourably (in *Deutsche Med. Wochenschr.*, 1880, No. 30), of oil of eucalyptus as an antiseptic, its special advantage being that it shows no tendency to cause eczema or to irritate the skin in any way. The solution employed by Siegen was made by dissolving 3 grammes of the oil in 15 grammes of alcohol, and adding 150 grammes of water; this quantity is enough to moisten thoroughly 1 meter of well washed gauze. The dressing is applied wet, and covered with gutta percha tissue; it may remain without changing for 3-5 days. It is noted that in one case an eczematous eruption, which had been caused by a thymol dressing, healed under the eucalyptus dressing in a few days.—*Cbl. f. Chirurg.* No. 39. 1880.

Physiological Action of Tulipine.—This is the name which Dr. S. Ringer gives to an alkaloid obtained from the bulbs, leaves, and flowers of the garden tulip, a liliaceous plant. As the result of a series of experiments, made chiefly on frogs, he submits the following statement of the action of this substance :—

1. Tulipine differs almost entirely in action from the alkaloids derived from plants of the natural order amaryllidaceæ.
2. It is a muscle poison, affecting the muscles like veratrine, but is weaker.

3. It paralyses either the cord or the afferent nerves, or both; but probably it affects the afferent (sensory) nerves, as it causes tingling.

4. It acts but slightly, if at all, on the motor nerves.

5. It affects the heart of frogs like veratria, the ventricles being found small, pale, and rigid; it stops the ventricles sooner than the auricles.

6. It does not affect the pupil.—*The Practitioner*. October, 1880.

Effects of Lightning on the Animal Body.—H. Nothnagel (*Virchow's Archiv*, vol. lxxx, p. 327).—A man, aged 30 years, was struck by lightning and remained five hours unconscious; when he recovered consciousness it was found that the right hand was paralysed and anaesthetic, conditions which persisted for ten weeks, and then suddenly disappeared in the course of two days. Six years after, the same paralysis and loss of sensation suddenly returned, and had lasted for several months, when he first came under N.'s observation. Treatment with the galvanic current made no change in the patient's condition. Treatment with magnets was then tried; a large horse shoe magnet was applied daily for several hours, with the striking result that in a few days motility and sensibility were completely restored, and the atrophied muscles soon regained their former volume. The author was then led to make a series of experiments on rabbits, submitting them to the powerful discharge of a large Leyden jar. It was found that this produced local anaesthesia of a degree and extent proportionate to the strength of the shock and the points of entrance and exit of the electric current. At parts the cross section of which is small the anaesthesia was slightest. Sensation was always perfectly restored in a short time. Powerful discharges produced motor paralysis of the extremities, which also speedily and completely disappeared.—*Cbl. f. Chirurg.* 18th September, 1880.

Treatment of Jaundice.—The treatment advocated by the author of this paper, as suitable in the majority of the non-fatal cases of jaundice, is the administration of large doses (15-45 grains) of ipecacuanha, which may be several times repeated, the dose being generally preceded by sedative draughts, and the external application of mustard to enable the stomach to retain the remedy. Three cases of hepatogenous icterus successfully treated in this way are given. In these it is said that the beneficial action of the ipecacuanha is

exerted on the mucous membrane of the bile ducts, in common with that of the intestinal tract generally, affecting first the larger branches, and in relieving their congested and tumefied condition permitting the gradual reinstalment of the bile current; the obstruction in front being removed, the smaller branches then unload themselves, and the beneficial action reaches the ultimate radicles and the liver-cells. The action of this remedy in hæmatogenous icterus is more doubtful; if it is to do good, it must commence its action either by altering the constitution of the blood itself, or by acting directly on the liver-cells. A case of this variety of jaundice is recorded, in which ipecacuanha seemed to exert a very favourable influence. Another case is mentioned, in which the remedy acted well when given by enema.—*The Practitioner.* August, 1880.

Chloral and Chloroform in the Treatment of Tetanus.
—Dr. Gardarianu bears emphatic testimony to the value of these remedies in tetanus. The chloral should be given in doses of one drachm, while the chloroform should be administered by inhalation, as required. This combination is stated to be the most rational and useful method of treatment yet proposed for tetanus.—(*Thèse de Paris.* No. 268, 1879.) *Bull. Gén. de Thérap.* 15th September, 1880.

Hygienic Treatment of Varicocele.—Dr. P. Vautier rejects the suspensory bandage in the treatment of varicocele, on the ground that it supersedes the natural support given to the testicles by the contractile dartos tunic and by the cremaster muscle, the tonic contraction of the latter especially aiding constantly in the emptying of the spermatic veins. These natural forces are lost if the parts be artificially supported, while the heat generated by the bandage also tends to prevent the scrotum from contracting. The author advises rather, in the early stages of the affection at least, prolonged rest in the horizontal position, varied by gymnastics or other moderately violent exercise.—(*Thèse de Paris.* No. 432, 1879.) *Bull. Gén. de Thérap.* 15th September, 1880.

Necrosis of nearly the entire Temporal Bone.—Dr. J. Gottstein gives details of a very unusual case of this kind in *Arch. f. Ohrenheilk.* xvi, p. 51. The patient was a child aged eighteen months, who had suffered for about a year from discharge from the right ear, and from a series of abscesses over the mastoid process. When the case came under Gottstein's observation a swelling was noticed immediately behind the

ear; at its summit was a small opening through which a point of bone, covered with thick pus, projected. The opening was enlarged, and a large sequestrum of bone removed. This sequestrum included not only the whole of the mastoid process, but also the bony case of the tympanum, the osseous portion of the Eustachian tube, a part of the squamous portion of the temporal bone, and the anterior and posterior walls of the pars petrosa with the cochlea and semicircular canals. Under antiseptic treatment the wound closed in a few days, and the otorrhœa shortly afterwards ceased.—*Cbl. f. d. Med. Wiss.* 14th August, 1880.

Test for Arsenic.—In a paper on chronic accidental poisoning, which treats of poisoning by lead and by arsenical wall papers, an easy and reliable test for arsenic is commended to the busy practitioner, Reinsch's test taking too much time, and Marsh's being somewhat dangerous. “Immerse the suspected paper in strong ammonia, on a white plate or saucer; if the ammonia becomes blue, the presence of a salt of copper is proved; then drop a crystal of nitrate of silver into the blue liquid, and if any arsenic be present the crystal will become coated with yellow arseniate of silver, which will disappear on stirring.”—*The Practitioner.* September, 1880.

Prophylaxis of Renal Convulsions.—Dr. A. Segur concludes a paper on this subject with the remarks that we should study the convulsions of puerperal women as a symptom solely, indicative, in almost all cases, of insufficient performance of renal function. Such convulsions are simply one of a uræmic train of symptoms. Prophylaxis resolves itself into the preventive treatment of uræmia, as at the setting in of the uræmia it is very often too late to avert convulsions.—*Proc. of Med. Soc. of County of Kings.* October, 1880.

Treatment of Strabismus by Mydriatics, without Operation.—M. Boucheron bases his treatment on the physiological fact that accommodation for short distances is governed by the convergence of the eyes. He proposes to combat the excessive convergence of hypermetropic eyes, and the consequent convergent strabismus, by temporarily suppressing accommodation through paralysis of the mechanism of accommodation with atropine. The *sine qua non* of success is the intermittent character of the squint, as this indicates that the internal recti have not yet undergone that retraction which is a consequence of their habitually vicious

position. The instillation of a 0·3 per cent solution of sulphate of atropine should be made on the first appearance of the squint, and into both eyes; one or two drops of this solution dropped in morning and evening will be sufficient. The atropine should be employed till the squint has disappeared when the child looks closely at anything. This puts a hypermetropic squinting child into the same condition as one who is hypermetropic, but does not squint. The strabismus, as a rule, disappears in two or three weeks, but tends to recur for several months. If atropine be not well borne it should be replaced by other mydriatics, such as duboisin. In nine cases of intermittent convergent strabismus occurring in children, this treatment gave successful results in eight.—(*Le Progrès Médical*. 10th July, 1880). *The Practitioner*. September, 1880.

Treatment of Hooping-Cough.—Dr. Cornilleau has made an exhaustive trial of Gibert's treatment in hooping-cough. This consists in the administration, to a child of three years, of 3-6 pills daily, each containing 1 milligramme of extract of belladonna and the same quantity of tartrated antimony. Dr. C. found that this treatment was followed by great improvement in about a fourth of his cases, by considerable improvement in about another fourth, and by no apparent good effect in one-half.—(*Thèse de Paris*. No. 415, 1879.) *Bull. Gén. de Théráp.* 15th September, 1880.

Parotitis as a Complication of Ovariectomy.—It is well known that there is an obscure pathological bond of connection between the testicles and the parotid glands, diseases of the former structures being not uncommonly associated with inflammation of the latter. This fact finds its analogue in the female sex, in the relation here noted between parotitis and diseases of the female reproductive organs. R. Möricker calls attention (*Zeitschr. f. Geburtshilfe und Gynäk.* Vol. v, p. 348) to this hitherto unnoticed connection, which was suggested to him by the circumstance that in 200 cases of completed ovariectomy performed by Schröder, parotitis occurred five times. In three of these cases the gland suppurated, and one patient died from this complication. In at least four of these cases, it is remarked, it is certain that the patients were not suffering from any kind of infectious disease, and the parotitis is therefore regarded as metastatic. The parotitis appeared in the latter half of the first week after operation. The author concludes that this is a complication which must

always be kept in view, especially when dealing with patients of feeble constitution. He offers no explanation of the connection between these affections.—*Obl. f. Chirurg.* 9th October, 1880.

Therapeutic Use of Sclerotinic Acid.—This is a substance which has recently been extracted from ergot of rye, of which it seems to possess most of the active properties. Dr. Stumpf, under the direction of Professor Ziemssen, of Munich, has carefully investigated its action, and published the results of his inquiry in *Deutsches Arch. f. Klin. Med.* 23rd October, 1879. Sclerotinic acid is a pale brown, amorphous powder, very hygroscopic, and readily soluble in water, yielding a brown solution having the smell and taste of extract of meat. It may be given hypodermically or by the mouth; by the latter method only when a rapid effect is not desirable. The local effects of subcutaneous injection are sometimes severe enough; thus, in 49 cases out of 100 it caused slight pain, in 37 cases considerable redness, in some instances a certain amount of induration, and on 5 occasions abscess. It is, nevertheless, in this respect, still preferable to ergotine, as the latter usually produces more intense local disturbance. The principal practical drawback to this method of treatment is that the solution is extremely unstable, undergoing alteration sometimes within two days, while the powder itself is very hygroscopic; it is therefore necessary to take special precautions for the preservation of the drug. The dose employed varied from 2 to 60 centigrammes; no symptom of poisoning was observed. The results obtained in the treatment of haemorrhages were such as to show that sclerotinic acid may fairly be ranked as equal in therapeutic value to the other preparations of ergot of rye; bearing in mind the rapidity of its action, and its relative harmlessness when used hypodermically, it may be regarded as superior to ergotine. In 3 cases of profuse menorrhagia, 8-20 centigrammes sufficed to arrest the discharge. Metrorrhagia, especially that due to chronic metritis, was more obstinate, though in some instances a rapid cure was effected; 3-4 injections were generally required, and in one case 18. In 3 cases of abortion and haemorrhage during pregnancy, a single injection stopped the bleeding; another case required 6 injections, which caused the expulsion of a portion of the membranes, while another case was unaffected by the remedy. The special action of the drug on uterine contraction was shown in a case of haemorrhage, thought to be due to fibro-

myoma, in which a single injection led to the expulsion of a five months' foetus. In haemorrhage really due to fibro-myoma it proved successful; and in another case of the same affection, in which it was given for three weeks by the mouth, the tumour shrank to the size of a nut. In 11 cases of haemoptysis it failed; in 5 it succeeded; in 2 cases of grave epistaxis also it failed; it was successful in 3 out of 4 cases of haematemesis, and in 4 out of 5 cases of intestinal haemorrhage accompanying typhoid fever. In a case of cancer of the larynx it temporarily arrested the bleeding when injected into the substance of the growth. The author further shows, by means of the sphygmograph, that the drug produces (1) a diminution of the tonicity of the veins, and consequently stasis of blood in the larger venous trunks; (2) a diminution of blood pressure; (3) emptiness and contraction of the arteries.—*Bull. Gén. de Thérap.* 30th September, 1880.

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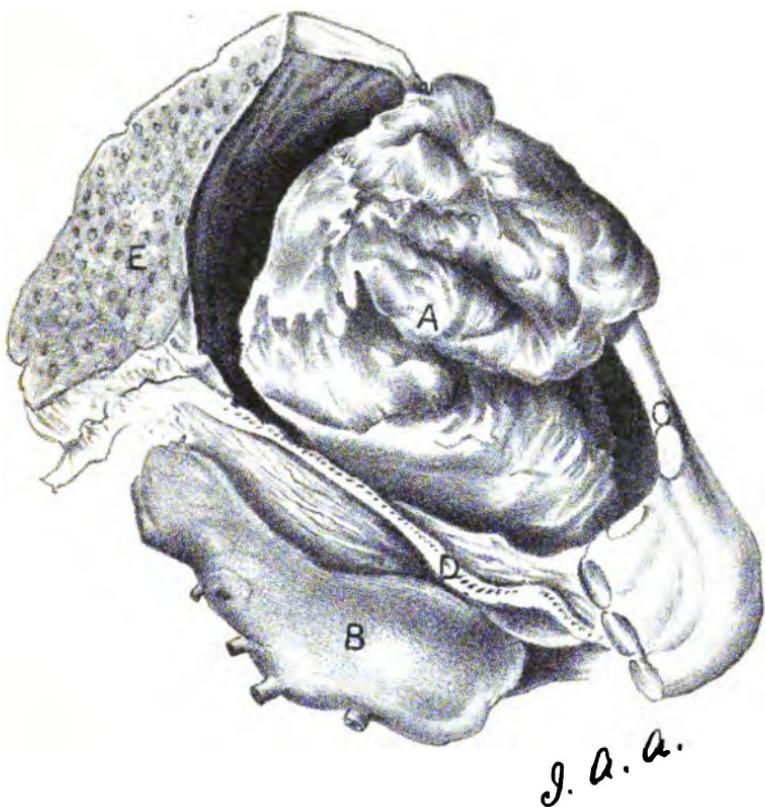
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"ON DIAPHRAGMATIC HERNIA"

JAMES A. ADAMS, M.B.



- A. TUMOUR FROM SPLEEN
- B. SPLEEN
- C. RIB
- D. CUT SURFACE OF DIAPHRAGM
- E. LUNG (SECTION)

THE
GLASGOW MEDICAL JOURNAL.

No. XII. DECEMBER, 1880.

ORIGINAL ARTICLES.

ILLUSTRATIONS OF EPILEPTIC MANIA AND OF
THE AUTOMATIC PHENOMENA OF EPILEPSY;
LIKEWISE OF MANIACAL ATTACKS FOLLOWING,
AND ALSO TAKING THE PLACE OF URÆMIC
CONVULSIONS.

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(Read before the Medico-Chirurgical Society of Glasgow, on 5th Nov., 1880.)

THE connection between the mental disturbance indicated by the words "delirium" or "mania," and the motor disturbance known as "convulsion," has long been familiar to the profession. In children, for example, we find that conditions associated with delirium in the adult are often in their case complicated rather with convulsions. In the now familiar phenomena of aphasia we find motor disorder, sometimes paralytic, sometimes convulsive, associated with a most curious and interesting perturbation of the use of language, which is, as we all know, essential to the carrying on of the higher mental operations.

The recent developments of cerebral physiology have lent a peculiar interest to this subject, as it seems now well established that the convolutions on the surface of the brain, so long and so well recognised as concerned in the processes of thought, have also, at least in certain regions, a presiding

influence over localised muscular movements in the limbs and elsewhere.

In the case of the aphasic lesions already alluded to, which are now well known to be localised in certain parts of the cerebral cortex, we may perhaps get a hint as to the nature of the connection subsisting between the processes involved in muscular movement and in mental action. The disturbance in the mental operations concerned in the use of language is now traced with great precision to a portion of the brain which, according to the researches of Ferrier, is the same as that concerned in the movements of the tongue. How closely the movements of the tongue are connected with language, even when it has got the length of being converted into written characters, is known to us all; for we remember how that as boys we repeated or mumbled the words we were reading by ourselves from a book; and even after we got beyond this stage, we continued to move the lips slightly or occasionally while reading, or were conscious of an incipient effort at framing the words in our mouths. Even now, when we come to a sentence which we cannot quite grasp, it is common for many of us to pause and read the words aloud, or in a whisper, by way of fully understanding their meaning.

As the centre in the cerebral convolutions which presides over the movements of the tongue becomes, in virtue of this humble office, the fitting centre for the noblest powers of language, so some philosophers have regarded the highest centres of all in the cerebral convolutions as the fitting seat of the highest mental operations, just because they were likewise the ultimate or controlling centres for *ALL* the sensory impressions proceeding from the outer world to the individual; and also for *ALL* the motor excitations proceeding *from* the individual, and manifesting themselves in muscular movements, or in more occult ways.

Without discussing this theory, it may suffice for our purpose to mention it as an ingenious explanation of the close connection between the phenomena usually termed mental, and those sensory and motor phenomena with which, in a perverted form, we have to deal in this paper. For even those who may resist most strenuously this teaching, must admit the closeness of the connection here referred to, although a different interpretation or complexion may be put upon the facts.

We need not stop to enumerate the usual phenomena of an epileptic fit, as we are all familiar with them; but if any one were to sit down to express in words what was really essential

to an epileptic fit he would find great difficulty in satisfying himself. For every one of the features, or at least almost every one of the features, usually present, may, in particular cases, be absent. There may be no aura, no screaming, no falling, no convulsion, no foaming at the mouth, no stertor, &c. Often, indeed, we may have traces of these, the falling and convulsions being only indicated by a pause or a stagger of the most minute duration. Some writers, however, claim pallor, and some claim unconsciousness as invariably present in what they would term "epilepsy." With regard to the pallor, it is such a delicate matter to estimate its presence or degree with precision, that we may ignore this as a test; but the occurrence of a complete loss of consciousness is insisted upon by many as a distinguishing feature in all epileptic fits. No doubt, as a rough clinical test, this point is one of importance, provided its roughness be borne in mind. But nearly all those who have paid much attention to the actual facts observed in convulsion fits will admit that this test cannot be absolutely trusted. We are confronted with the question, What is loss of consciousness? and how is it recognised? In many cases, no doubt, we can affirm with the greatest confidence the presence of consciousness or of unconsciousness. When you see and hear one reading a paper like the present, you cannot doubt the consciousness of the reader; and when you see a person deeply under chloroform, not even moving a limb when the surgeon makes his incisions, you say, with equal confidence, that the person is unconscious. But if the limb moves a little, and if the face winces slightly during the operation, you would hesitate to deny that the person was unconscious, even although his face might show the habitual expression of pain, and the movement of the limbs might indicate an apparent desire to remove them from the source of irritation. If this be so, what shall we say of the state of the patient during the administration of the chloroform—the struggling, singing, and shouting so familiar to us all, and yet so completely out of keeping, in most cases at least, with any true consciousness in the person about to undergo some serious and dangerous operation? For surgical purposes we would, of course, say he is not yet unconscious; but from a common sense point of view we say he is unconscious, although thus carrying out complex and complicated automatic actions. Or to take another phase of behaviour, when the patient looks at the chloroformist and deliberately spits in his face, is he conscious or unconscious? He must be conscious of the presence of the attendant, he must be conscious of the saliva in his mouth,

and he must have sufficient consciousness to direct the complicated muscular movements in ejecting the spittle; in all these lower senses he is conscious; but in the higher sense, we must admit that he is already unconscious; and morally the surgeon acquits the patient of blame for spitting in his face, just as freely as he does by and bye if the blood from a cut artery spouts into his eye. We must all, therefore, admit different degrees of loss of consciousness; or perhaps, rather, different kinds of unconsciousness. Familiarity with all sorts of phases of this loss of consciousness makes those who study epileptic fits unwilling to admit this test as really satisfactory. But even apart from this, we find cases where the consciousness is *not* lost; where the patient is obviously and confessedly quite conscious, and yet the fit presents in other respects such a resemblance to the typical attacks of epilepsy that we cannot separate the one from the other by this arbitrary distinction, particularly as this same patient, at another time or in another part of the same fit, may be affected with the form of convulsion admitted by all to be truly epileptic.

Coming now to the subject of Epileptic Mania, we may profitably institute a comparison between certain mental and motor phenomena. After an epileptic fit we can occasionally recognise some paralysis of the motor function. This is most conclusively ascertained when the convulsions are unilateral, as in this way we have a basis for true comparison; and a form of epileptic hemiplegia has long been recognised by the best observers. Fortunately, this hemiplegia, unless the case be complicated, is usually transient, and passes largely or wholly away. In the language of the Jacksonian doctrine of epilepsy, the "discharging lesion" in the cerebral convolutions, having exhausted the nerve force during the violent convulsion, has led to a temporary paralysis, which lasts till the nerve force is restored. But if the "discharging lesion" has involved some of those higher centres concerned in the operations necessary for the mental activity of the individual, we may find, after the fit has passed off, that the exhaustion of these centres leads, not to a paralysis of the muscles, but to a paralysis of the higher consciousness of the patient; this we recognise by the extraordinary character of his behaviour immediately after the fit, and by the rapid return to his true or habitual disposition. We are all familiar with the slighter manifestations of such mental aberrations immediately after a fit, and even more violent displays are not uncommon. Occurring in such a way, the mental aberration, whether slight or violent, is

unmistakably connected with the fit, and may be regarded as constituting a part of it, just as much as the aura which preceded the convulsion.

This leads us to the important consideration that just as an epileptic fit may occasionally consist of the aura only, and nothing else—the fit being, as it were, aborted or suppressed—so, in other cases, we have the epileptic mania only, all the other phenomena of a typical attack being suppressed, or at least occurring in such an obscure form as not to be recognisable.

This proposition may seem, to some, too theoretical or transcendental, and perhaps the best way to support it will be to take a case where the outbursts of mania were of such a character as to appear uncomplicated with fits, but where a study of the facts enabled an experienced observer to recognise, at times at least, the indications of an epileptic fit in a slight form.

A boy, 10 years of age, from Alexandria, was admitted to the Western Infirmary on two occasions, which were separated from each other by an interval of a few months. The personal and family history were both somewhat complicated, and, in general terms, may be described as unfavourable. On the first occasion of his residence he had been noticed to have slight startings, as if in a fright, and sometimes twitchings about the mouth, but no very definite convolution fits. He was sent for a time to the Convalescent Home.

When admitted the second time, he was noticed to be more stolid, and we had to wait a minute or more to get answers to questions put; but when once he started he could give a fair account of the things he spoke of. During the first night of his admission he was restless, and got up, stood at the fire, and walked up and down aimlessly, and was with difficulty persuaded to go back to bed.

A few nights later he got up and attacked a boy (with chorea) lying in the same ward, seizing him by the throat; and, when caught by the nurse and patients, he screamed and kicked violently; he went to bed quietly, however, when the house physician came up, but he only remained for a minute or two, and getting up again he fled as if in terror, but when caught went again quietly to bed. He got up a third time, and soon after this had a conversation with the resident physician of a connected and perfectly sensible character. He got a draught of chloral and bromide of potassium, and went to sleep quietly till the morning. At the visit hour in the morning he was found perfectly quiet and rational, and

gave a long and connected account of his stay at the Lenzie Convalescent Home; he danced a hornpipe he had learned there, and sang also some parts of a tune. Very soon afterwards, however, on the same day, he had several maniacal attacks, with intervals of quietness, and on one occasion was caught clambering up the door of the hoist on the landing. Several times during the day he fell on the floor, but no twitchings occurred, nor could it be affirmed that he lost consciousness.

On the following day he had again several attacks of fury, lifting the tongs to one of the men, and also biting the nurse's hand. He fell frequently during the day, and in the afternoon he fell backwards with some force, suffering a severe scalp wound at the back of his head. After this he seemed pretty clear for a time, and his mother, who was quite aware of his troublesome and dangerous attacks, believed her son's connected account as to the nurse having thrown him down on the floor when his head was cut, and it was in connection with these delusions, apparently, that he attempted vengeance on the attendants. It was only by taking the mother to question the patients, in the absence of the nurse, that she was persuaded that the boy's circumstantial account was erroneous.

During this same afternoon I saw the boy in the ward, and noticed certain momentary staggerings backwards, which I could not doubt were really slight fits; and some of these, more severe than the rest, had evidently caused him to fall, and, attributing the inexplicable fall to the action of those near him, he proceeded in his ungovernable fury to use violence to them. It must be specially noticed that not only to his mother did he give such a connected story as to make her believe his tale, but that, during the outburst at night, soon after the throttling of the patient, the violent screaming, and his attempted climbing at the hoist, he spoke to the house physician in a most connected manner, and in a way that gave no hint of the maniacal excitement through which he had just passed.

The case may perhaps be best considered as presenting maniacal attacks *after* fits, which were, however, usually so slight as to elude recognition, although they were occasionally more distinct, giving rise to stumbling on the floor, and probably also affording the occasion for his sudden starting up from bed. The story is by no means a very uncommon one, and no doubt our friends engaged in lunacy practice see many cases essentially similar. Unfortunately, however, their

experience, although so valuable, frequently fails to carry conviction to the public, or even to the legal mind when narrated in court; probably because there is a wide spread conviction that the patients in asylums, being labelled as "insane," differ completely from other people; and that aberration of mind, with or without epileptic outbursts, is their usual condition. The narration of this case, occurring in general practice, may therefore seem to some more striking, especially as I believe some difficulty was experienced at first in procuring certificates of insanity for his admission to an asylum. He was, however, soon afterwards sent to the Stirlingshire Asylum. He seems to have had, while there, some outbursts of violence; and his father said that he had injured his face in one of his attacks by knocking his head against the door. He died not long after this; and I learn from the Asylum that his death was preceded by a series of convulsion fits of more than ordinary severity. A *post-mortem* examination was made, but unfortunately no details can now be supplied.

Epileptic mania, however, may occur without the least trace of anything corresponding to a convulsion fit, the explosion being, as it were, mental instead of motor in its character. When such cases result in violence and murder, there is great unwillingness to admit that a person who goes through all sorts of purposive actions, who procures suitable weapons, and uses them in a business-like way, can possibly be in a state comparable to that of an epileptic fit. The idea of loss of consciousness, so generally associated with the epileptic state, appears inconsistent with actions obviously purposive in character. It cannot, however, be too strongly insisted on that an elaborate series of actions, of a purposive character, may be carried out although the true and higher consciousness of the individual is suppressed. When these purposive actions result in some terrible tragedy, and when the surroundings are such as to suggest motives for retaliation or revenge, it is difficult for lunacy experts to obtain a fair and impartial hearing; particularly is this the case in the present state of the administration of justice, which allows, and we may say almost encourages, the calling of experts on both sides, as if they were special pleaders retained to support a foregone conclusion for the side on which they receive their fees.

Some good purpose, therefore, may be served by calling attention to other cases of epileptic seizure, in which, happily, no disastrous or violent results are observed, but in which the patient goes through a long series of actions automatically, sometimes for hours together, under circumstances which leave

no doubt that his true consciousness is abolished, although he may preserve consciousness of a kind sufficient to enable him to execute complex processes of action, and to take part with others in doing certain things, while he may even answer questions, or possibly take directions from those about him. Indeed, he may perform his part so well in his automatic way, that it may escape notice, at least for a time, that he is affected with anything unusual.

Amongst these automatic forms of seizure, one of the commoner consists simply in unconscious walking. The person starts off from a point of locality and time which he can define, but thereafter knows nothing more till perhaps he discovers, by his whereabouts and the time of day, that he must have been walking a long distance unconsciously. A year or two ago, I saw a patient with Dr. Allan, who was subject to "queer turns," as noticed by his wife and his fellow-workmen, and on one occasion he started off, and only regained consciousness after walking out several miles from Glasgow, on the way to Kilsyth, and he had to inquire at a toll-house whereabouts he was when he came to himself on the road. This patient seems never to have had epileptic fits, but there is reason to believe that his "queer turns" were closely allied to pronounced insanity; and that he had, at the same time, strong promptings to self-destruction. He is, however, at present tolerably well, and has been fit for work since the attack referred to, although off duty at that time.

In the case of a little girl of 8 years, in the Western Infirmary last year, the patient had seizures which appeared to me to be essentially epileptic; indeed, before her admission, the convulsive part seems to have been more pronounced, with twitching of the mouth and face, and also of the limbs. During her stay in the hospital she had, perhaps, 10 days free from fits, and thereafter several fits daily—perhaps as many as 6 or 8 in a day. Occasionally they occurred while she was in bed, when she suddenly started up, fumbled with the bed clothes, and muttered something unintelligible. She appeared to feel the fit coming on, as she often rushed to the water bottle for a drink, and her mother had the idea that this sometimes warded off a fit, but the explanation of this conduct could not be clearly made out. During the fit she may stand and turn round and round several times, or she may shuffle about with her hands, and stagger on the floor; the face is turned somewhat convulsively first to the one shoulder and then to the other; the mouth is contorted, the eyelids quiver and the eyeballs roll. If standing or sitting when the

fit begins, she often falls or slides down to the floor, but never violently. Sometimes she walks about in a staggering manner, and seems as if searching under the chairs or beds, or about her own clothes or bedclothes, and often mutters something in an unintelligible way, but does not answer if spoken to. Once or twice she laughed or was angry looking, and even struck some one during the fits. The attacks lasted about one or two minutes, or perhaps three or four minutes sometimes. She occasionally felt sick before the attacks came on, and has even vomited. The child is small and delicate looking, having been born prematurely, and has always been dull; during her residence she was recognised by all the patients as stupid, babyish, and flighty.

She was searched out lately, and came up again a few weeks ago. Her fits are apparently more severe; she usually falls down now when they come on, and she often clutches at her mother when the attacks come on in bed. The convulsive element is evidently more pronounced again, as there is spasm of the hands and drawing up of the legs with marked rigidity. *After the fits* she still seems at times to search about her clothes as if for something she had lost. Her intelligence has fallen off even more of late, and she cannot go the simplest message.

The next case presents the most striking illustration of this curious automatic condition. A man, 35 years of age, has had, repeatedly, pronounced epileptic fits of the most typical character, with every one of the commonly observed symptoms, so that there can be no doubt that he is subject to epilepsy. But in addition to these, which come on comparatively seldom, he has frequently those curious seizures which manifest all sorts of automatic action. Some of these fits were seen when he was, for a short time, in the Infirmary; and I likewise took pains to ascertain from the master under whom this man served as a grocer, that the fits, while he was with him in the shop, were essentially similar to those illustrations about to be given here. When his master saw him in one of his fits, perhaps moving his hands as if filling imaginary bags of sugar, he often got him to move to the back of some barrels, and left him there till the attack passed off. When admitted to the Infirmary he had been affected for about three years, and he has been seen frequently as an out-patient for the last eighteen months.

The following notes were made from information given by his wife, and particularly by his sister-in-law, who seemed to have watched him most closely. His first attack occurred

when he was going down stairs from his house on his way to his work, when he stopped short, and returned home and went to bed. He had no idea of what had occurred till he afterwards found himself there. Next month he met his niece one night in Crown Street, at 8 P.M., and spoke to her, but he immediately turned round and did not appear at his house till 11 P.M., although it was quite at hand. The same month he was returning from his work one day, with the intention of going to a funeral undertaker's in Eglinton Street (on some funeral business), and his way lay through the Bridgegate, where he met a friend who spoke to him. His friend noticed him looking queer; the patient said something about going to the undertaker's, and was proceeding to enter some shop of quite a different character, and in the wrong street, when his friend took him to his house and gave him his dinner, which he took well enough. Some time after dinner the patient came out of the fit, and could not understand how he had got into his friend's house. He is said not to have spoken all that time. One of the commonest things he did in these attacks was taking off his clothes and going to bed. In this connection it may be stated that we ascertained that it was his custom, as with many of his class, to take off his coat immediately on coming into his house, and this may have started him in his process of stripping. As a rule, when a fit came on, it was stated that he would let anything fall out of his hand which he might be holding at the time, and on one occasion he even let a child fall in this way. Sometimes, however, he held an unusually strong grasp, as was noticed on one occasion while in the Infirmary.

He had several fits while in the Infirmary. The following may be taken as an illustration:—One evening it was noticed that he took his supper rather more hurriedly than usual. After finishing, he went and got the broom to sweep the floor, although it was not customary to sweep the floor at that time of the day; after proceeding with this, he stopped and got a bed cover from one of the beds, spread it out on the floor, and lay down on it as if he were going to sleep. On being asked what he meant by lying down there he muttered something incoherently; but, on being asked to do so, he got up and took the end of the supper tray, and, with another patient, carried it, as usual, to the pantry at the end of the corridor. When half way back the other patient said something about the operating theatre, the door of which they were then passing, and this is the first thing the patient could remember as having occurred after taking his supper.

While at home, during a fit, he frequently took down dishes from their shelves and replaced them correctly enough ; and on one occasion he took down a teacup and passed water into it. More than once he began to take off his clothes and to lie down in the entry at the foot of the stair, or in the street ; and on several occasions he was taken to the police office while in one of these fits, and liberated when he recovered, so that, fortunately, he had no complaints to make against our police administration.

The patient is a slim-looking man, with a small head ; he is moderately acute even now, is a good arithmetician, and was a fair workman till this affection rendered him useless for the management of a shop. His family history is highly consumptive, and his illness was supposed by his friends to be connected with the cessation of a discharge from a suppurating gland following an attack of measles, which he had had a year or two before his first fit. He had at one time been in business for himself, but had been unfortunate and blamed his partner's conduct. It would appear that at this time the patient himself had been addicted to the undue use of alcohol, but to what extent and for what length of time, could not be ascertained. Various remedies were tried over a long series of months, but no distinct improvement could be obtained.

The second portion of this paper deals with a somewhat different subject—viz., some of the phenomena of uræmic poisoning observed in renal disease. Amongst the manifestations of serious nervous disorder met with in this alarming condition, we are all, I daresay, more or less familiar with coma, convulsions, and twitchings. We often also find certain degrees or forms of delirium, wandering and muttering, but so far as I have observed myself, or can gather from others, anything like distinct maniacal attacks must be regarded as rare. On this account alone, the two following cases are well entitled to claim attention ; but they are brought forward here as striking illustrations of the occurrence of mental disturbance, in the one case *following* the motor disturbance of uræmic convulsions, and in the other *replacing*, as it were, this more familiar complication.

An unmarried woman, 32 years of age, employed as a washerwoman, was admitted to the Western Infirmary in a state of insensibility. She was supposed to have caught cold a week before, and had been complaining for a few days of severe headache ; this culminated in what would seem to have been a convulsive seizure and deep insensibility. After admission to the Infirmary she had one or two general convulsions,

and one of these occurred at the visit on the morning after admission. The urine drawn off by a catheter was of a high specific gravity, depositing urates when it cooled; but it was also highly bloody and loaded with albumen: under the microscope, hyaline and granular tube casts were found in considerable number. Although no dropsy existed anywhere, and although the history in no way pointed to the existence of renal disease, the diagnosis of uræmic convulsions seemed quite clearly made out: the presence of blood in quantity pointed either to an acute attack, or perhaps to some exacerbation in the course of chronic and latent disease of the kidney. The treatment adopted by my assistant on admission was the use of sharp purgation by croton oil, and at my visit next morning this seemed to have had some good effect, but the insensibility was still very deep, and another convulsion occurred in my presence; as the skin had a pungent, offensive odour, the nurse was directed to wash her carefully with soap and warm water, and thereafter to apply hot wet blankets as a "blanket bath." Directions were likewise given to administer an enema containing chloral hydrate and bromide of potassium if the convulsions returned. Fortunately, there was no recurrence of the fits; the blanket bath was applied once or twice, free perspiration ensued, and in the course of the evening some return of consciousness was noticeable.

But although consciousness returned and no convulsions recurred, the condition of the nervous system was far from satisfactory. She was found on the fifth day after admission still very stupid in her answers to questions, and she imagined she saw various people and things which had no existence, and once or twice tried to get out of bed. On the following day, she had become very unmanageable; she was constantly wishing to get out of bed, and could only be restrained by an attendant sitting constantly beside her. She talked about not wishing to have other people's clothes, and was constantly trying to put aside her own bedclothes and take those from an adjoining crib in the ward. She was also very sleepless and appeared not to have had any sleep since she came out of the comatose state. Bromide of potassium having been tried alone, the night before, without effect, she was ordered on this forenoon 20 grains of chloral hydrate and 3*i* of bromide of potassium. This took effect almost immediately, and she slept quietly the whole of that day and on to 6 A.M. the next morning, although she was roused up occasionally to make sure that she was all right. She was found next morning at the visit evidently much refreshed, and her mental condition

almost completely restored, although perhaps for some time after she was a little peculiar or weak-minded. No further development of mental disorder occurred, and when searched out last month, she was found quite sensible in every respect, and fit for her work. She does not appear to have had any previous derangement of mind in any way, and the maniacal attack seemed to arise immediately and directly out of the convulsive seizure.

A few words are required as to the progress of the case in other respects. After the comatose state passed off a great improvement was noticed in the urine; the quantity, which had been small, increased considerably, and in a few days rose to 60, 80, or 100 oz. per diem; the specific gravity fell from 1030 to 1026 or 1024 for a few days, and then to 1018, 1012, and 1010; the blood disappeared and the albumen was reduced to a minute quantity. Unfortunately, however, she suffered a relapse, the blood returning in the urine, the temperature rising, and the albumen again becoming abundant, although the quantity of urine never became scanty. There was reason to fear that this relapse may have been due to want of care, and that she may have been chilled in getting up and going to the bath room, although she had been warned against this. As already stated, she was a little peculiar for a time after her recovery from the maniacal attack, and it was known that she had run certain risks which should have been avoided. The further course of the urinary symptoms now became complicated by the occurrence of cystitis, with pain in micturition and pus in the urine. This was treated by various remedies, the use of belladonna amongst others, and the washing out of the bladder once or twice with water containing a few drops of dilute nitric acid. This measure seemed to afford considerable relief, and the patient was dismissed almost free of the pain in micturition, and nearly well in every other respect. There was, however, still a certain amount of pus in the urine, and this prevented any accurate estimate of the state of the renal secretion.

After dismissal, she seems to have had a return of the severe headache, and for two months she had swelling of the feet and legs, although there had been a complete absence of dropsy during the whole of her residence. This, however, has now disappeared for some time back; but she still feels some pain in the sacral region, and her urine, when tested last month, was found to be free of pus, but of a pale colour with a low specific gravity, and containing a small but very distinct quantity of albumen.

She is, however, actively employed as a washerwoman, although this seems perhaps one of the very worst forms of occupation in which she could be engaged. There is reason to fear that this woman is the victim of one of the serious forms of chronic disease of the kidney.

The last case to which I have to call attention was that of a blacksmith, 40 years of age, who presented the combination of cardiac, renal and hepatic disease, with considerable dropsy, and great lividity and dyspnœa, such as we frequently see in hospital practice. There was an old story of inflammation of the kidneys, and the swelling had quite the character and distribution of renal dropsy; but there was obviously serious cardiac disease as well, not merely hypertrophy, but also aortic incompetency. The urine was scanty, high coloured, dense, and presented great abundance of albumen: it was also bloody, and contained numerous tube casts. The course of the dyspnœa and dropsy varied considerably, but the maniacal outburst, about to be referred to, occurred when the patient appeared to be improving a little. 15 grain doses of chloral hydrate had been tried on three successive nights for the restlessness and dyspnœa, with apparently a good effect; but partly because the patient seemed a little better, and partly to avoid the habitual use of such a drug, this dose was omitted on the night to which attention has now to be called. The patient, notwithstanding the omission of the draught slept pretty well that night, and complained of nothing. About 6 A.M., however, the nurse noticed him plucking at his bedclothes, and shortly afterwards he insisted on getting out of bed: he was coaxed to return, but would allow of no blankets being placed on him. He soon became more restless, and insisted on getting up and walking about, and as he was a very strong man he could not be controlled. Stockings were put on his feet to lessen the danger of a chill, but he pulled them off again and again till it seemed useless to replace them; more than once also he stripped his shirt and drawers off so as to be quite naked. On replacing his clothes, his flannel drawers were stitched to his shirt, and but for this artifice he would frequently have removed them again; his stockings were likewise stitched to his drawers, but the stitches being more within view and reach than the others, he frequently picked them out. His mind seemed engrossed with religious subjects, and he constantly repeated fragments of prayers. When I saw him at mid-day, he presented an extraordinary appearance of excitement. Unable to lie, or sit, or stand, he was constantly on the move, and using such phrases as "For

Christ's sake, Amen," or other fragments of prayer, almost incessantly. When spoken to by me, immediately after my arrival, he was a little quieter, and even tried to sit down for me to examine him; but in a minute or so he was up again, repeating his formulæ and fussing about with his hands, trying to undo his clothes. Another extraordinary proceeding was his way of constantly spitting slightly on his hands and rubbing his bare feet. We supposed that this might be brought about by their feeling so swollen and stiff. When spoken to sharply by a new comer he was somewhat more rational for a minute or two, and even answered some questions, but this phase rapidly passed off as he became used to the stranger's presence.

He was seen at this time by Dr. Joseph Coats, and we ordered him a drachm of the compound jalap powder; as this began to irritate the intestinal tract, his ideas and remarks were diverted from religious subjects to the state of his bowels, and he spoke of this nearly as much as he had done of religious subjects, and likewise referred in his remarks to the state of the bowels of those around him. When he became a little quieter, he was tried with a warm foot bath for his feet, and he sat down on the edge of the bath and passed a motion in this way. The powder acted freely, and the motions were passed either on the floor or in bed. By and bye, he became quite tired out, and he then complained of headache; he went to sleep a little and became obviously more conscious, answering questions more rationally, and ceasing to tear off his clothes. Advantage was taken of his quieter disposition to administer the blanket bath, and free perspiration was obtained. He slept during the night, and next morning was quite rational. The dropsy was also somewhat less. He seemed but little the worse of the exposure and fatigue of his terrible day's proceedings, of which, of course, he had no recollection.

He remained under observation for some ten days more, without any notable change, and was then taken home to the country, still, of course, in a most precarious condition.

These two cases just narrated presented serious nervous disturbances which were evidently due to the poisoning of the system arising from renal disease. In the case of the woman we had, indeed, one of the forms commonly observed—viz., general eclampsia, with profound coma in the intervals. This was, however, followed by a period of wakefulness, and this again by well marked mania. Her condition at this time resembled closely the appearance of a person with one of the less violent forms of puerperal mania, and I could not help

being forcibly reminded of Dr. Donkin's paper "On the Pathological Relation between Puerperal Mania and Albuminuria." (*Edin. Med. Journal*, 1863.) I confess that the facts adduced in that paper did not seem to me to be sufficient to bear out the conclusion which the author tried to establish, and one of the objections, among others, which I saw to the acceptance of the doctrine was, that mania was not a recognised complication of Bright's disease, or one of the commonly observed phenomena of uræmic poisoning. When this case occurred, therefore, under my own eyes, I could not fail to be impressed with the apparent support it gave to the theory which I had been, just at the time, considering and rejecting.

Within three months the other case of the blacksmith occurred in my male ward. His condition was such that an attack of uræmic convulsions or coma would not have appeared at all astonishing, but in its place, we had a sudden outbreak of mania of the most striking character, which completely passed off in the course of a day, under treatment by purgation and diaphoresis.

In these uræmic cases, as in those of the epileptic seizures detailed in the first portion of this paper, we find the same alternation of motor and mental disturbance insisted on in the preliminary observations; in the case of the woman the mania followed the convulsions very directly, for the patient never slept from the time she awoke from the coma till the very culmination of the attack; in the case of the man, we may very fairly regard the maniacal attack as replacing the more familiar convulsive seizure.

In view of the close connection between these motor and mental explosions we may call to mind the fact that in the case of the poisoning of typhus fever we have a state of matters presenting a striking contrast to that of uræmia. In typhus, we have almost invariably, in the case of adults at least, more or less delirium, usually of a very pronounced kind, and not unfrequently associated with maniacal excitement, while convulsions may be regarded as one of the rare complications. In uræmia, on the other hand, convulsions may be regarded as common, while maniacal excitement would seem to be decidedly rare.

CASE OF CANCER OF THE MAMMA IN THE MALE,
PRECEDED BY SO-CALLED ECZEMA OF THE
MAMMARY AREOLA, "PAGET'S DISEASE OF THE
NIPPLE."

By ROBERT W. FORREST, M.D.

*Communicated to the Pathological and Clinical Society of Glasgow,
May, 1880.*

— THOMPSON, aet. 72, male, consulted me a few weeks ago about a sore on his right breast. It began, he said, early last summer as a leakage on one side of the nipple, the secretion, using his own words, being "a substance resembling woman's milk," which crusted on the sore; the crusting went on till he removed the scabs, which he was in the habit of doing every three or four weeks, after softening them with oil; the skin thus exposed was red and tender, and it again began secreting and crusting as before. About six months ago the nipple began to be retracted, and about the same time, or shortly after, he observed that there were hard enlarged glands along the lower border of the pectoral muscle and in the axilla.

This case, which now presents the appearance of an ordinary cancer of the breast, derives its interest chiefly from its history as given by the patient, which shows it to be allied to the cases of disease of the mammary areola preceding cancer of the mammary gland first described by Sir James Paget.* It is interesting also from the patient being a male, the cases hitherto recorded having all been females.

The all important clinical and pathological questions to be determined, so that the disease may be treated satisfactorily, are, What is the true nature of this disease of the nipple and areola? and whether it can be differentiated from an eczema or psoriasis, curable after a longer or shorter period by ordinary treatment? Mr. Paget writes,† "I am not aware that, in any of the cases which I have seen, the eruption was different from what may be described as long persistent eczema or psoriasis or by some other name in treatises on diseases of the skin. I believe such cases sometimes occur on the breast, and after many months' duration are cured, and are not followed by any other disease; but it has happened that in every case which I have been able to watch, cancer of the mammary gland has

* *St. Bartholomew's Hospital Reports for 1874*, page 87.

† *Ibid.*

followed within at most two years, and usually within one year. The eruption has resisted all treatment, both local and general, that has been used, and has continued even after the affected part of the skin has been involved in the cancerous disease. The formation of cancer has not in any case taken place first in the diseased part of the skin, it has always been in the substance of the mammary gland beneath, or not far from the diseased skin, and always with a clear interval of apparently healthy tissue." He says that "clinically * there was a time in such cases when the disease was not cancerous, and a time when cancer was sure to occur. They were examples of a very large group of affections which are liable to become cancerous, e.g., ichthyosis of the tongue, and many more conditions in which cancer was likely to supervene later in life; whether the result of a gradual process or the introduction of a new factor, he could not say."

Mr. Paget suggests no diagnostic mark of the affection other than its apparent incurability, and in a guarded way advises removal of the diseased skin when it appears incurable by milder means.

Mr. Hutchinson says † they were clearly dealing with the pre-cancerous stage of cancer, and he thought that if an eczema of the nipple resisted treatment for a long time, then surgical interference should be had recourse to.

The clinical history and minute anatomy of the disease have been carefully investigated by Mr. Lawson,‡ Mr. Butlin,§ Mr. Morris|| and Dr. Thin.¶ Mr. Morris mentioned that out of 305 cases of cancer, or supposed cancer, of the breast treated by him in the cancer and out-patient department of the Middlesex Hospital, up to the end of 1877, there were only two instances in which the association between the two diseases had existed; he said it certainly was a special disease, although unable to distinguish it from ordinary eczema by its appearances.

Mr. Butlin was sure, both on microscopical and clinical grounds, that the superficial disease in the large majority of cases was inflammatory; microscopically, because the changes

* "Transactions of the Clinical Society of London," *Lancet*, 1879, vol. ii, page 636.

† *Ibid.*

‡ *Ibid.*

§ "Transactions of the Royal Medical and Chirurgical Society," *Lancet*, 1876, vol. i, page 92.

|| "Transactions of the Royal Medical and Chirurgical Society," *Lancet*, 1879, vol. ii, page 873; and *Lancet*, 1880, vol. i, page 92.

¶ *Ibid.*

in the epithelium do not spread into the cutis, or subcutaneous tissue, or from the interior of the main ducts into the surrounding tissue; clinically, all the appearances were those of inflammation, not of cancer. In one case he found all the ducts in the nipple full of diseased epithelium, in others the change was limited to some of the ducts which could, however, be traced directly down to the cancer in the gland. He was of opinion that the superficial disease is not a mere sign of the deeper cancerous disease, nor even a mere precursor of it, but that it is an actual cause of that disease.

Dr. Thin did not regard the eczema as preceding the cancer, but the contrary. There was evidence of epithelial growth in the lactiferous ducts, and he suggested that the epithelium might remain long affected but quiescent, still, however, causing the production of a certain amount of cancer juice, which would produce a destructive and incurable affection of the skin in the vicinity, and eventually the change is propagated to the gland itself and neighbouring lymphatics.

The case he has examined, and, so far as he could judge, all the cases which had been published of this peculiar condition of the nipple had been associated with duct cancer. This peculiar affection of the nipple, although not cancerous in itself, was yet very different from simple inflammation; the tendency of inflammatory change, which was not kept up by some specific cause, was to heal, but this disease of the nipple persists, and shows therefore a constant cause in operation, which destroys the vitality of the tissues. This effect Dr. Thin attributes to the discharge of fluid through the ducts, from accumulation near their mouths of cancerous epithelium. He believes that at the very outset of the superficial affection there is already cancerous change in the duct epithelium, and that nothing short of its removal can save the patient. He did not consider that diagnosis was impossible. In one of the cases referred to, the affected skin was moist, red, and discharging, but yet sharply bounded by a clear border. When grasped between the thumb and forefinger, the induration could be felt in the superficial part of the skin, the sensation produced being as if a penny were laid on a soft elastic substance, and grasped through a piece of cloth. In another case the diseased portion was covered with ragged epithelium, and bounded by a well marked ridge of raised epidermis. He believes that the evidence points to a slowly advancing cancerous change near the mouths of the lactiferous ducts, which at a very early stage leads to irritative effects in the superficial tissues of the nipple and surrounding skin, and

eventually penetrates into the substance of the mammary gland.

Chronic skin affections of the breast will now be more closely scrutinised, and their after history observed more carefully than hitherto; and the value will be tested of the diagnostic points suggested by Dr. Thin, for the discrimination of this all but incurable affection, from obstinate cases of true but curable eczema, which it often so closely resembles.

PRACTICAL PAPERS ON THE MATERIALS OF THE ANTISEPTIC METHOD OF TREATMENT.

By GEORGE BEATSON, B.A. (Cantab.), M.D. (Edinb.)

VIII.—ON SPRAY PRODUCERS.

(With Twenty Woodcuts.)

As is well known, one of the leading features of Lister's antiseptic treatment of wounds is the exclusion from them of the exciting causes of putrefaction. To insure this it is necessary that the atmosphere surrounding them be freed from the germs and noxious particles which are constantly present, and have the power of imparting to serous or purulent fluids those septic or fermentative changes which are known as *putrefaction*, and which carry in their train such a host of evils. Without going into a history of the means adopted, from time to time, to obtain this gernless, and, consequently, harmless atmosphere, I may say that at present it is brought about by the use of spray producers, which emit a spray of carbolic acid large enough to envelop any wound, both at the time of its infliction and at any other time that it may be necessary to remove its antiseptic dressings and expose it to the air. In this, the concluding paper of the present series, I propose to give some accounts of the instruments usually employed for this purpose, but I have thought that it would make the subject more complete, and perhaps more interesting, were I to incorporate with it some account of the first attempts at the atomisation of fluids. Accordingly, I shall arrange my remarks under the three following heads:—(1.) A short history of the origin and progress of spray producers. (2.) A description of some of the

most approved instruments at present constructed for carrying out Lister's system. (3.) Some general remarks on the selection and management of spray producers.

(1.) *History of the Origin and Progress of Spray Producers.*—This section of my paper is so intimately associated with the question of medicinal *inhalations*, that I must briefly introduce that subject. From the earliest times the value of local applications to the mucous membrane of the respiratory tract was recognised by medical men, and with *volatile* substances there was no great difficulty in carrying out this line of treatment, each practitioner adopting, in a great measure, his own particular plan. Thus, Hippocrates tells us (*De Morbis*, lib. ii, sec. v) that he was in the habit of employing an apparatus which "consisted of a pot, the lid of which had an opening for the reception of a reed, through which the vapour escaped and was inhaled through the opened mouth: the latter being protected from scalding by moistened sponges." (Beigel.) Any such procedure, however, was quite useless in the case of *non-volatile* substances, many of which were known to be of great therapeutic value. Some physicians, as Aretæus, tried to overcome the difficulty by blowing the medicinal substances through a tube, just as is done in the present day in treating affections of the middle ear, while at some watering places they attempted to create an atmosphere suffused with mineral water for inhalation. Such a plan, as may be supposed, only resulted in furnishing a simple vapour bath for the patients, as there could be no medicament in the water. The first practical suggestion for the atomisation or minute division of liquids holding *non-volatile* substances in solution came from M. Auphan, at the Spa of Euzet les Bains. Bearing in mind that water exists in the form of spray, when dashed with violence on hard bodies, as in waterfalls and in the breakers of the sea-shore, he conceived the idea that the water at the mineral spring might be *atomised* by directing a jet of it forcibly against the walls of the apartment for inhalation. This was the first real attempt at *atomisation* of fluids, and the method was adopted in other continental spas, coming into pretty extensive use at the different watering places. It was, however, a coarse and ineffective way of accomplishing the object aimed at, and one quite unsuitable for private practice. Under these circumstances, M. Sales-Giron, a medical man at Pierrefond, in France, directed his attention to the matter, and taking up the idea of M. Auphan he worked at it for some years, and at length, in the year 1858, he was enabled to lay before the Academy of Medicine, at Paris, a portable *inhalation appara-*

tus, whereby medicated fluids, either volatile or non-volatile, could be dispersed in the form of a fine spray, and thus be made available for treating diseases of the respiratory organs. The accompanying woodcut, Fig. 1, shows the instrument of

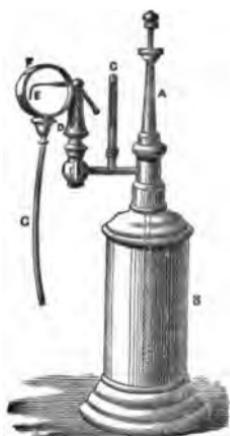


FIG. 1.

Sales-Giron. He termed it his "Pulvériseur portatif des liquides medicamenteux." It consists of a vessel filled with the fluid to be atomised, while above it is placed an air-pump, A, which compresses the air above the surface of the water, the pressure being indicated by a manometer, C. When the instrument is at work the fluid escapes through the fine opening of a tube with a stopcock, D, and strikes against a small metal disc, E, where it is broken and turned into a very minute vapour, any of the condensed vapour escaping through a small tube, G. The exhibition of this apparatus of Sales-Giron before the Academy, raised the question as to whether or not this *pulverised fluid*, as it was termed, could

reach the bronchial tubes, and when, after careful enquiry, it was decided that it could do so, the full value of the invention was seen, and we find Rousseau stating "that Sales-Giron has rendered a great service to the world at large by his invention of the treatment by pulverisation." Indeed, we may be said to owe the inhalation of *atomised fluids* to Sales-Giron, just as we are indebted to Dr. Alexander Wood, of Edinburgh, for the hypodermic injections of medicines. As was to be expected, Sales-Giron's instrument underwent various modifications, but the principle was the same in all, and consisted in forcibly impelling a jet of liquid through a capillary orifice against a small metallic disc or button, by which it was broken up into minute particles. In the following year, 1859, we find M. Mathieu, of Paris, contributing a new idea for obtaining the pulverisation of fluids. He exhibited his apparatus to the Academy of Medicine at Paris, and termed it Nephogène. In it the subdivision of the medicated fluids is brought about, not by checking the jet against a solid body, but by forcing the fluid to escape at high pressure, along with a blast of compressed air, through a tube with a small opening. Fig. 2 shows Mathieu's original instrument. In it the air is compressed in the brass ball, A, by means of the pump above it, whilst the fluid to be atomised is put

into the glass ball, B. As soon as the instrument is set in motion the two stopcocks are opened, when the medicated fluid escapes drop by drop into the tube C, and there meets the



FIG. 2.

blast of compressed air, which forcibly projects it outwards in the form of a very fine but cold spray.

All the instruments for pulverisation of fluids which were constructed before the year 1862 were made either on this principle or on that of Sales-Giron, but in that year there was brought forward by Dr. Bergson, of Germany, an important modification in the mechanism necessary for carrying out Mathieu's idea. Bergson called his instrument "Hydrokomion," or "Water Dust Apparatus," and in the accompanying woodcut, Fig. 3, I give an illustration of it. It consists essentially of two glass tubes, with capillary openings at one end, placed at right angles to each other. The open end of one tube dips into a vessel filled with the fluid which is to be subdivided, A, while the other, D, is fastened to a caoutchouc tube, about a yard long, having on it two globular or spindle-shaped expansions, one in the middle, B, representing an air reservoir, and the other at the end, C, a pair of bellows. If this latter ball is pressed by the hand, the air in

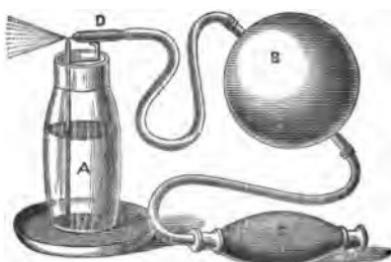


FIG. 3.

the middle ball is compressed and is forcibly blown through the horizontal tube, D. As the current escapes from the fine orifice of this horizontal tube it passes over the mouth of the other tube, creating in it a vacuum, or a tendency to a vacuum, as a consequence of which, first the air in the tube and afterwards the liquid in which it is immersed rises, and becoming thoroughly mixed in an atomised state with the air is driven forward with it in a constantly expanding jet of spray. The success of this arrangement was soon ensured, and as we shall see farther on, it has served as the model for different spray producers of more recent date. Dr. Bergson seems to have had the idea of these tubes suggested to him by a Dr. Natanson, and their motive principle is the same as that embodied in Gifford's steam injector for feeding boilers; but he undoubtedly

was the first to bring them out in connection with the subject of atomising fluids, and accordingly they are still known by his name. They are familiar to us in the "*odorateurs*" sold for blowing perfumes about a room: and the original Bergson's tubes, as shown in the woodcut, Fig. 4, were made of glass, of about the diameter of a goose quill, and were fixed in their due

relative position by a sort of glass elbow, c, extending from one to the other.

Bergson's development of Mathieu's principle was, however, soon to receive a further elaboration in the substitution of vapour or steam for atmospheric air. This idea was brought prominently before the public by Dr. Emil Siegle of Stuttgart, who took out letters patent for a *steam spray producer for inhalation* on April 22nd, 1864, and in a work published in the same year (A. Kroner, publisher, Stuttgart) he describes his instrument. I give here an illustration of it in its original form, Fig. 5, from which it will be at once apparent that what Siegle did was to connect Bergson's spray tube with a glass boiler, using steam for producing and conveying the spray instead of air. I know it is a moot question as to whether or not Siegle was the first to employ steam in that capacity, for in the *Allg. Med. Centralzeitung*, No. 42, 1862, Dr. H. Waldenburg, of Germany, described an instrument by means of which he could produce medicated spray *in combination with steam and through the motive power of that principle*, but his apparatus was entirely different from that of Siegle's. Whether or not Siegle had ever seen Waldenburg's paper I cannot say. If he had, he worked out the idea differently,

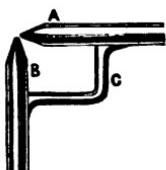


FIG. 4.

utilising, as we have seen, Bergson's tubes. Siegle's spray, however, as originally made with its glass boiler and thermometer, Fig. 5, had many defects, and it was subjected to a good deal of criticism, as a consequence of which various improvements were instituted, one of the chief of which was the adoption of an improved boiler. This latter was no doubt borrowed from an inhaler which was brought out by Dr. Adams of Glasgow in the year 1868. Space does not allow me to go into the many advantages possessed by this boiler, but they are very fully enumerated by Dr. Adams in a paper in the *Glasgow Medical Journal* for March, 1879. Fig. 6 shows a sectional view of Adam's inhaler, which is the model on which all of Siegle's later instruments were made.

Experience soon showed that steam sprays had a good deal to recommend them, especially as compared with those in which the dispersing power is compressed air, for it was found that they gave off a steady uniform stream of spray, warm in character and so fine as to cause little irritation, while, being self-acting, they neither fatigued the patient nor required an assistant. In this way they became extensively used.

Meanwhile, Bergson's tubes were also becoming more widely known among English practitioners, in a great measure through the exertions of Dr. Andrew Clark, of London, who was anxious to have an instrument that would give a con-

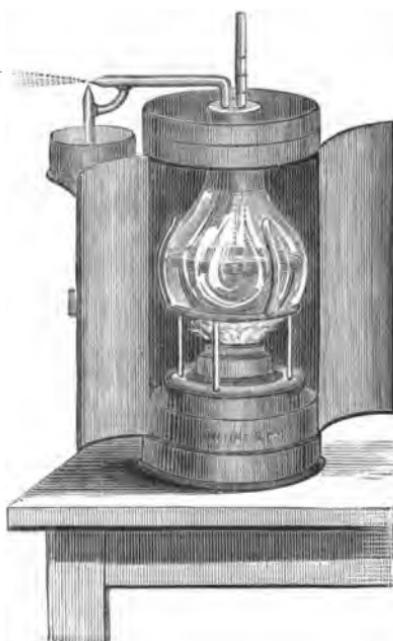


FIG. 5.

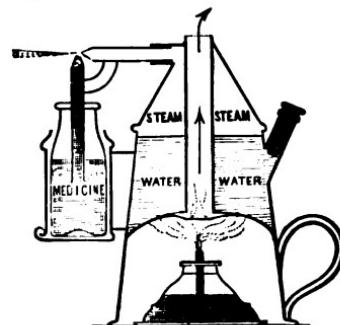


FIG. 6.

tinuous spray, and with this view he had a pair of Bergson's tubes fitted into the cork of a graduated glass bottle, and had attached to them a double hand bellows with suitable valvular arrangements which allowed of a constant spray being kept up for an indefinite time. This instrument was made for him

by Krohne & Sesemann in the spring of 1865, and has since been known as Clark's spray producer. It is seen in Fig. 7, and it will be at once recognised as merely an improved edition of Bergson's original idea.



FIG. 7.

It is right, however, that I should state that the above account of the course of events is not quite in keeping with that given me by Messrs. Krohne & Sesemann. They claim for Clark's spray producer the distinctive feature that it was the first apparatus to which

a *double* hand bellows was attached, and that Bergson's original instrument was worked with a *single* ball. I have tried to get the paper in which Bergson first published his suggestion, but I have been unable to do so. All the writers, however, whom I have consulted speak of the original Bergson as having a double hand bellows, and in Fig. 3 I give an illustration of it from Beigel. Under these circumstances all I can do is to give Krohne & Sesemann's statement and leave the matter at present open. There seems no doubt that the netting placed over the second ball in the double hand bellows is the suggestion of that firm of instrument makers.

What tended as much as anything to spread a knowledge of the double hand bellows as a motive power for working spray producers, was the appearance of Dr. Richardson's ether spray for producing local anaesthesia. This instrument, Fig. 8, was brought out in January, 1866, also by Krohne and Sesemann, and soon became very generally known. In its mode of action it follows more the principle of Gifford's steam injector, and consists of a graduated bottle for holding the ether, while through a perforated cork a *double* tube is inserted, one extremity of the inner part of which goes to the bottom of the bottle. Above the cork, a little tube, connected with a hand bellows, pierces the *outer* part of the double tube, and by means of a small aperture at the lower part of this outer tube communicates

with the interior of the bottle. The inner tube for delivering the ether runs upward nearly to the extremity of the outer tube. When the bellows are worked, what takes place is this:—A double current of air is produced, one of which descends into the bottle and presses upon the ether, forcing it

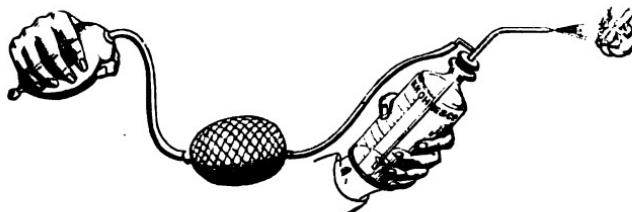


FIG. 8.

along the inner tube, while the other current ascends through the outer tube and plays upon the column of ether as it escapes through the fine jet. The size of the jet modifies the amount of the ether, and consequently the size of the spray. It is thus apparent that Richardson's spray, though atomising the fluid by incorporating it with a current of air after Mathieu's idea, differs in its construction somewhat from



FIG. 9.

Bergson's instrument, though acting on the same principle. Dr. Richardson's instrument was some time afterwards followed by Dewar's spray producer, Fig. 9, connected with the great

“sulphur cure.” It was almost an exact imitation of Dr. Clark’s, but differed from it in having the tubes elongated and made of vulcanite, with gold or silver points. Other forms of instrument have from time to time made their appearance, in some of which the tubes are arranged parallel, as shown in Fig. 10. This instrument is very portable and

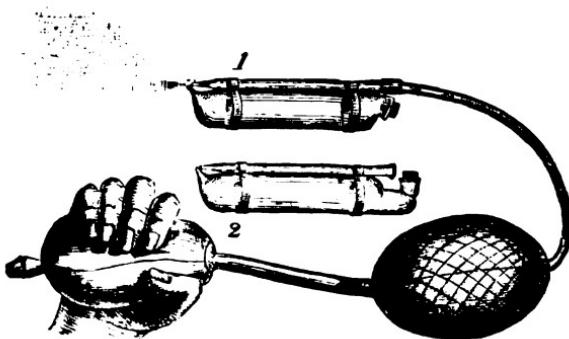


FIG. 10.

handy, and was devised by Dr. Brakenridge, of Edinburgh. I need not pursue this part of my subject any further, as I think I have made it clear that the spray producers of later years, though modified in form, are all more or less the outcome of the original, very simple, and ingenious apparatus devised by Dr. Bergson, and pourtrayed above in Fig. 3.

Such was the position of matters as regards spray producers when Mr. Lister turned his attention to utilising them in the carrying out of his antiseptic system. When the idea first occurred to him I cannot say, but the first published notice that we have of the use of the *gauze and spray* is in the *British Medical Journal* for 14th January, 1871. At first Richardson’s ether sprays were used, and they answered very well, notwithstanding their small capacity, and the limited cloud of spray they produced. With the object of meeting these drawbacks, a larger hand spray was introduced, worked by the double hand bellows, and, from time to time, various modifications were made in it, chiefly at the suggestion of Mr. Lister. Thus, he had a break made in the air tube, and had it filled up with a piece of rubber-tubing to allow of its being compressed, so as to regulate the jet of liquid according to the volume and coarseness of the spray required. He suggested also the hood for protecting the points from injury, and the insertion of a bit of sponge in the lower end of the water

tube to act as a filter, and prevent the points being blocked by particles of dust. Another very important alteration was the substitution, for a stopcock, of a small screw at the end of the water pipe, which allowed of the flow at the water jet being regulated. This simplified the manufacture of the tubes, and reduced the price. Sometimes accidents happened, owing to the tubes with the cork coming out of the bottle, which, if not held in the hand, fell to the ground, and was broken. To obviate this, Mr. Baldwin, when serving as dresser under Mr. Lister, had a wire guard made, which secured the cork in position while the instrument was in use. When all these alterations were carried out, together with the substitution of india-rubber corks for the spray bottles, the hand spray was a most serviceable one; and I sometimes think, looking back to the early days of antiseptics, that at present hand sprays are not appreciated as much as they ought to be. Did the length of this paper allow, I could point out many advantages belonging to them. When I speak of the antiseptic spray producers at present in use, I shall give an illustration of the instrument described above, showing the different improvements mentioned. One of the most marked changes, however, made in the construction of the sprays was the substitution of foot bellows instead of those worked by hand. This had been done as far back as 1867 by Krohne & Sesemann, and attached to Richardson's ether sprays for dental purposes, but Mr. Lister's adoption of them tended to popularise them, and I shall show afterwards an illustration of an apparatus known in the trade as Lister's foot spray producer. There was still a more important change to come yet, and that was the use of steam as the motor power in the formation of the spray. It was in the winter session of 1872-73 that Mr. Lister made the announcement at a clinical lecture, at which I was present, that he purposed using steam sprays in future, in the management of his cases, and he exhibited one of Siegle's in working order, and pointed out how it would answer. The small size of the Siegle was against its general use, for, though quite suitable for changing a dressing, it was quite useless for an operation. This led to the construction of larger instruments of more complicated character.

The instruments of the present day are, no doubt, most efficient in every way, but few know the labour gone through and the time spent in devising their shape and arrangements, so as to make them portable and reliable. Soon after commencing to construct them, it was found that doing so was an infringement of Siegle's patent, and an arrangement had to be

come to, whereby, on payment of a certain royalty for each spray, the necessary liberty for making them was granted. It would be too long a story to go into all the difficulties encountered and overcome in the construction of what are now known as Lister's antiseptic spray producers, but there is one point that I must allude to, as it caused a great deal of trouble, and at one time threatened to interfere very materially with the usefulness of steam sprays. I refer to the difficulty experienced in providing a suitable lamp for the production of the steam. The first of the larger instruments were furnished with circular wicks like those seen in moderator lamps. These were made sometimes of cotton, at other times of metal gauze, so as to prevent their being burnt away, and they could be moved up and down by a rack movement. They were found, however, not to answer, as the vapour of the spirit was drawn up by the heat, and was at once set on fire whenever any movement of the spray took place, or any current of air affected the flame of the lamp, as a result of which explosions occurred, enveloping the instrument in flames and proving a terror to every one in the vicinity, to say nothing of the risk run in having perhaps to stop the spray at a critical part of an operation. With a view of remedying this state of matters, wire guaze was put round the lower part of all sprays, to break draughts and permit the instrument being carried about, and attempts were made to isolate the different parts of the lamp, as, for instance, the central part from that holding the spirit, by means of cylinders of glass, wood, vulcanite, asbestos, and other substances. All were found useless, and it was clear some other form of lamp would have to be got. A trial was next made of a lamp much used in France for boiling the contents of coffee machines, and consisting of a metal tube perforated with holes, and surrounded at its lower part by a circular wick. When this latter was lighted, the vapour of the spirit rose, and finding its way out at the holes at the top of the tube became ignited. This answered very well in some respects, but there was no way of lessening the flame, and so Mr. Lister devised what is termed the "snuffers lamp," in which the wick at the lower part of the tube could be put out by bringing the ends of the snuffers together. But in connection with them was a small wick which still kept lighted, and when it was desired to rekindle the larger wick it was only necessary to separate the snuffers and bring the small wick into contact with it. Some sprays are still made with the snuffers, but they have been more or less replaced by a better arranged lamp, which we owe to Mr. Chiene, of Edinburgh, and

which is known as "Chiene's lamp." It has undergone one or two modifications since it first came out, but in its present approved form it is composed as shown in diagram, Fig 11. It consists of an upright burner tube, B, having a closed top, and provided with a number of fine holes all round just below the top. This burner tube fits into the closed spirit receptacle, A, and is furnished with a lateral air chamber, C, against the under side of which, the flame from a small wick burner, D, with a movable joint, can strike. The tube of this wick has attached to it a bolt, E, with a spiral spring, and a to and fro action, which allows of the wick being placed under or withdrawn from the lateral air chamber. The dotted lines show it in position when removed from beneath the air chamber. Further, the wick in the central tube only reaches as far as the air chamber, C. The action of the apparatus is as follows. When the wick burner, D, is turned, so that the flame strikes the under side of the lateral chamber, C, this latter becomes heated, and the heat being conveyed to the burner tube, B, and thence to the spirit in the wick, spirit vapours will arise therefrom and issue by the small holes at the top of the tube, B, where they will become ignited. When it is desired to regulate the amount of heat to be imparted to the spray producer, this can be done by adjusting the small burner, D, withdrawing it from the lateral air chamber when it is desired to lessen the amount of spirit vapour evolved, and thus diminish the flame, and replacing it when it is necessary to enlarge it. Mr. Chiene writes me that the above form of the lamp is considered the best after the result of a good many experiments. The side box, C, is best made hollow. When solid, it is of course more durable, but it has one fault, that the flame does not fall so rapidly after the small wick is withdrawn, and does not rise so rapidly after the small wick is brought below it. It is not necessary that there should be a hole through it, as the vapour of the spirit will easily become ignited. The to and fro action of the bolt connected with the small tube, D, has been found preferable to the swivel movement, as being less liable to go out of order and more protected. Considerable experience with the above lamp has only confirmed its value, and it is by far the best at present known. That it has some good in it is shown by the fact that it has been patented by a London

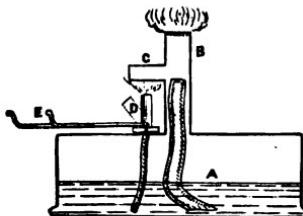


FIG. 11.

instrument maker, for I have seen the letters of specification, and they clearly describe Mr. Chiene's lamp, and none else. I have now, I think, touched on most of the improvements brought out from time to time in connection with the spray producers, and have thus paved the way for a better consideration of the next part of my paper, in which I propose speaking of some of the most approved instruments of the present day.

(2.) *Account of some of the Present most Approved Spray Producers.*—These may be most conveniently arranged under the three heads of (a) hand spray producers, (b) foot spray producers, and (c) steam spray producers.

(a.) *Hand Spray Producers.*—These are very numerous, but

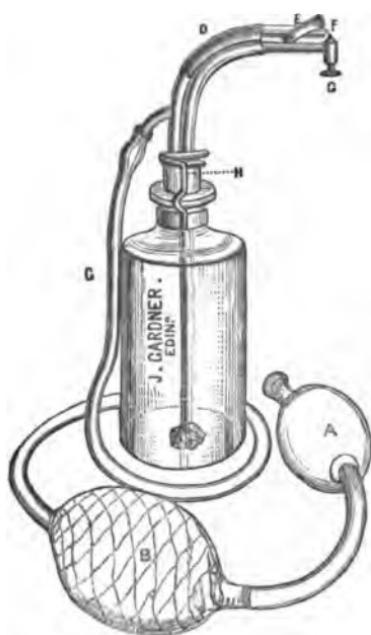


FIG. 12.

in Fig. 12 I give an illustration of one that I know from experience to be a very reliable instrument. It gives out a very satisfactory cloud of spray, and it embodies all the improvements which I spoke of above. Thus, at D, is seen the short india-rubber tube for compressing the air tube, while G is the screw for regulating the size of the liquid. E is the cap for protecting the points, and H is the wire guard for securing the indiarubber stopper while the instrument is in use. It can be obtained from Mr. Gardner, 45 South Bridge, Edinburgh, at a cost of 26s.

The only other hand spray I would allude to, is one devised by Dr. Reverdin, of Geneva, and it is so made as to be carried easily in the

coat pocket. In the accompanying drawing, Fig. 13, it is shown (1) in working order, (2) packed up for carrying, (3) furnished with a nozzle to act as a syringe, and (4) cover for the nozzle when the instrument is packed. It can be obtained, I think, from MM. Collins & Cie., Rue de l'Ecole de Médecine, 6, Paris.

(b.) *Foot Spray Producers.*—There are only two of these to

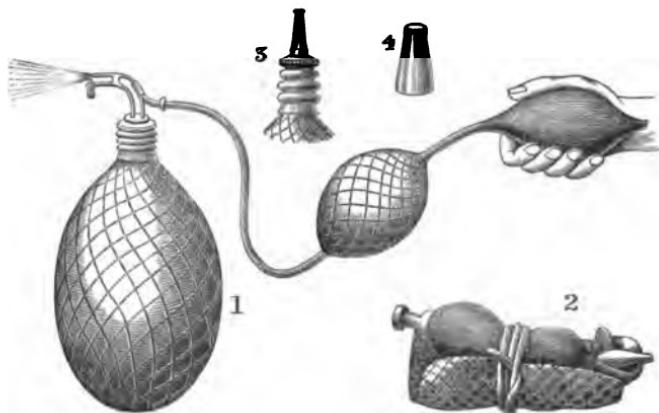


FIG. 13.

which I would allude, and they are both known as Lister's, though they differ in the arrangement of their parts. The one most in ordinary use is made by Mr. W. B. Hilliard, 63 Renfield Street, Glasgow, at a cost of 24s. I know it to furnish a good spray. The other form of foot spray is seen in Fig. 14, and is constructed that the bottle may be placed on the floor or carried in the pocket, while the long tubes can be guided in any direction needed. It was formerly very much used in Mr. Lister's wards. It is made by Mr. Gardner, 45 South Bridge, Edinburgh, and its price is £2, 2s.

(c.) *Steam Spray Producers.*—I had hoped to be able to give illustrations and descriptions of all the chief instruments constructed on this principle, but I find that the limits of my paper will not permit of this, and so

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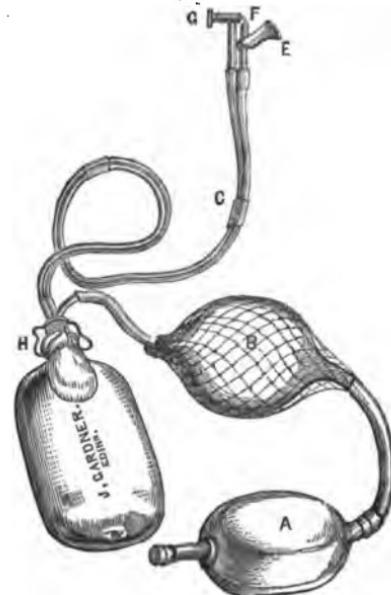


FIG. 14.

I can only allude to two, just mentioning the name of other makers. The ones I will bring under notice are Gardner's and Marr's.

(1.) *Gardner's Steam Spray Producers.*—Mr. Gardner, 45 South Bridge, Edinburgh, is the manufacturer of several varieties of steam spray producers, and indeed it was by him that the majority of the original instruments were made for Mr. Lister when he was in Edinburgh. He makes them in three sizes: (a) small, for changing dressings and short operations, (b) medium, for operations in private practice, and (c) large, for hospital use. As they are all constructed on the same pattern, I will speak only of the large one, which is seen in Fig. 15. It consists of a boiler and spirit lamp, which are

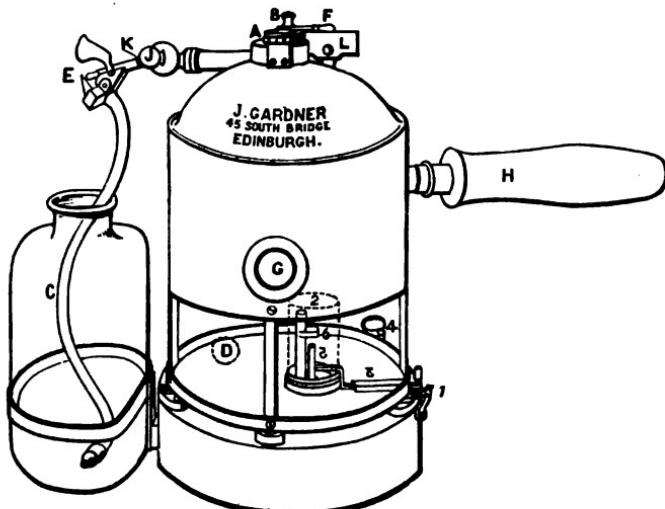


FIG. 15.

completely insulated by means of the non-conducting plates secured to the lamp. The boiler contains 24 oz. of water, and the lamp 18 oz. of methylated spirit. The carbolic acid solution is contained in a bottle attached to the side of the instrument, into which the india-rubber tube, C, dips. The handle is screwed into the side of the boiler. Owing to the construction of the joint, J, steam will issue from it when the spray points, E, are directed forwards towards the patient, but when the points are directed backwards over the boiler towards the person holding the instrument the opening is closed, and

no steam issues. The points are protected with a metal hood, and when obstructed they can be unscrewed at K and cleared with one of the soft metal wires supplied with the instrument. The lamp is that of Mr. Chiene, consisting of two tubes, a larger and a smaller, fitted with wicks, that in the former only reaching to the air chamber (6). The larger tube is fastened in position by a pin and slot, and to the small tube is attached a handle, with a to and fro action, by the movement of which the tube can be brought to and removed from the air chamber. The principle of the lamp I have already described. When it is in action, if the small flame is carried away from under the air chamber, the central flame then falls, but rises again if the smaller tube is replaced beneath the air chamber. These lamp tubes are protected by a metal cap, which serves as a measure to fill the boiler. If the boiler and lamp are full before commencing, the spray will last upwards of three hours, though it may be necessary to refill the bottle with carbolic lotion, and the lamp with spirit, both of which can be done without stopping the spray. The above instrument, with one jet, costs £8, 10s.; with two jets, £9. All Gardner's instruments are brazed, so that they are not liable to explode, and could even be put on the fire without sustaining any damage. They are also tested by Burgoyne's steam gauge up to 50 lbs., and are warranted to work at 20 lbs. pressure. No washers are used in connection with the taps, but they are all ground screw tight.

(2.) *Marr's Steam Spray Producers.*—Mr. David Marr, 27 Little Queen Street, Holborn, London, W.C., is the maker of four sizes of steam sprays, all similar in construction. Those shown in Figs. 16 and 17 are his No. 3 and No. 4, and are recommended for hospital work. No. 3, Fig. 16, steams $2\frac{1}{2}$ hours, and costs £6, 10s.; No. 4 steams 5 hours, and costs £8, 10s. His No 1, or pocket spray, steams about 1 hour, and costs £5, 5s.; while his No. 2, for private practice, works for one hour and a half, and costs £6, 6s. The No. 4, Fig. 17, is provided with double nozzles, costs £8, 10s., and steams for 5 hours. It is useful for such an operation as ovariotomy. All of these sprays are fitted with lamps on Chiene's model, which simplifies the



FIG. 16.

arrangements, owing to the absence of all rack work, and the flame can be moderated at the will of the operator. If necessary, with these lamps, the water can be kept at boiling



FIG. 17.

point for some hours. All Marr's machines are made of the best materials, are constructed under his own personal superintendence, and are thoroughly tested.

It is only the limits of my paper, and want of space, that prevent me noticing the instruments of other makers, as of Messrs. Allen & Son, Wright & Co., Arnold & Sons, Krohne & Sesemann, Matthews Brothers, Mayer & Meltzer, and Archibald Young. The instruments furnished by any of the above firms may be relied on as of good material and workmanship, and as furnishing a satisfactory spray. I may also say that, if desired, any of the above instrument makers will furnish sprays nickelled or platinum bronzed, the former process costing about one guinea. Cases, too, can be got for holding the sprays and carrying them about. They may be japanned, as made by Messrs. Matthews, at a cost of 8s. 6d., or they may be of wood covered with leather, and more expensive. Lastly, I would mention that sprays can be hired out to surgeons for operations, and to families if they have cases needing their use. Mr. Gardner, 45 South Bridge, Edinburgh, follows this plan, the terms being very moderate, and depending on the time the spray is needed.

(3.) *Remarks on the Selection and Management of Spray Producers.*—Commencing with the hand or foot instruments, the first point needing attention is the strength of the carbolic solution to be placed in them. This should be the 1-40 watery

solution. As Mr. Lister says:—"A solution of the strength of 1 to 40 is that which I would advise for providing an antiseptic atmosphere in the form of spray, when the particles of the liquid are dispersed by means of air impelled by hand bellows or a condensing pump." (*Lancet*, 13th March, 1875.) In working these instruments, the way to maintain a satisfactory cloud of spray is to compress the caoutchouc tube against the side of the bottle, and then fully and frequently work the hand or foot ball until the second ball, which acts as a reservoir, and is covered with a netting, is completely distended. If this is done at the commencement, the distension of the second ball is kept up by less frequent compressions, and the fatigue of working is considerably lessened. Another point of some importance is to regulate the jet of liquid according to the volume and coarseness of the spray required. This is best accomplished by compressing with the thumb the piece of short india-rubber tubing on the air tube and regulating by means of the screw at the end of the water tube the size of the jet of liquid. Owing to the fineness of the points of the tubes, they are apt to become blocked by any particles of dust or dirt present in the air or water, hence it is very necessary to have the lotion used for the sprays filtered, and also to place in the end of the water tube a bit of sponge to arrest such particles. The sponge should be kept in position by a bit of gauze, and should be changed at intervals. Should the points become blocked, the tubes should be removed from the bottle, and one of the fine needle wires supplied with every instrument should be passed through them *from within*. To enable this to be done in the case of the fine end of the water tube, a modification in its shape was carried out, which is thus described by Mr. Lister:—"Then it was necessary to provide some ready means of clearing the fine end of the water tube, in case of its obstruction by particles of dust. This is done by having the water tube straight for a short distance from the nozzle, and then bent at a right angle, with a little milled cap to screw on at the angle, so that in case of obstruction the cap is screwed off, and the orifice of the water tube is cleared at once with a needle or a bit of fine wire." (*British Medical Journal*, 26th August, 1871.) These remarks will be made clearer by referring to Fig. 12, where D is the short tube to be compressed for regulating the size of the jet, and G is the milled cap which can be unscrewed. The hood, E, should always be put down over the jets, F, to prevent them being injured. In using the spray for changing dressings it is always most important to lift up the

corner of the dressing nearest the spray, so that the cloud may be directed *into the angle between the dressing and the skin*; and here I may say that sometimes it may be necessary to stop the spray when a wound is uncovered and exposed to the air. Under these circumstances, Mr. Lister advises the use of what he terms the "*guard*"—"a piece of rag dipped in the 1 to 40 watery solution of carbolic acid." This should be placed over the wound, and then "the spray can be removed with security." Care should be taken that the rag composing the guard is made of sound calico, with no holes in it; and, when it is desired to remove it, the spray should be first made "to play on the part during the exposure of the wound until the permanent antiseptic dressing is re-applied." (*British Medical Journal*, 26th August, 1871.) The points, then, that require attention, in connection with hand and foot sprays, are the following:—(1.) The use of 1-40 carbolic lotion. (2.) Proper distension of the hand or foot ball apparatus before commencing. (3.) Regulation of the size of the jet of fluid. (4.) Insertion of a bit of sponge to act as filter in the water tube. (5.) Careful removal and cleaning of the jets from within with a fine wire should they become obstructed. If these matters are attended to, it will be found that these instruments have a good deal to recommend them. Thus, they do not get out of gear, they are very serviceable for changing the dressings in ordinary cases, being always at hand, and they are not expensive. The great objection to them is that they require considerable practice to work them without being fatigued, and that they necessitate the presence of an assistant. This is not so powerful an objection to them in hospital as in private practice, yet it seems to have weighed with Mr. Lister in making the change to steam sprays; for, speaking of sprays, he says:—"But I have of late found it more convenient to use high pressure steam as the motive power, on the principle of Siegle's steam inhaler, the apparatus, modified to adapt it for our purpose, being both self-acting and self-directing, so as to dispense with the services of an assistant." (*Lancet*, 13th March, 1875.)

In the second portion of my paper I have indicated the modifications alluded to, and have given illustrations of some of the instruments made by the best makers, so that I need say no more upon that head. Each one can select for himself the apparatus that he prefers. There are, however, some details that I think should be present in every instrument, to insure its being efficient, and these I will mention now:—(1.) The boiler should be dome-shaped, as being the strongest

form, and because this shape allows more surface to the flame for maintaining the pressure of the steam, and so steadyng the jet of spray. (2.) The boiler should by preference be of brass, as copper is too heating, and it should be completely insulated from the lamp by means of non-conducting plates. (3.) In constructing the boiler, it should be brazed, so that if the lamp be inadvertently applied while it is empty, there is no solder to melt. (4.) The aperture for filling the boiler should not be at its summit, but on a lower level, so as to leave a space clear for the steam, where it may become somewhat dried, and also to obviate overfilling the boiler. If this last takes place, when the steam is turned on a jet of scalding water is ejected, and the steam point may be blocked by solid particles being washed into it by the water. (5.) Every boiler should have a good safety valve, made either with the ordinary spring, or with the lever and weight. (6.) There should be a glass window in the boiler to show when the water is down and needs replenishing. (7.) The lamp should be simple in construction, and should allow of its being easily raised or lowered without completely extinguishing it, thus allowing of steam being kept up when the spray is not actually in use. (8.) There should be an arrangement for altering the incidence of the spray, so that it may be directed upwards or downwards as needed. (9.) Two jets to a spray are advantageous, as they allow of a larger cloud being obtained if required, and of the spray being kept working should one set of points become obstructed. This end may equally well be attained by having a set of spare points for screwing on in case of any stoppage. (10.) It is better to have the carbolic point united to the steam point at an angle of forty-two degrees instead of at right angles, as it prevents the fluid collecting in drops on the point of the carbolic tube, and thus ensures more perfect volatilization of the acid. (11.) The antiseptic cloud thrown by the spray producer should not only be a large one, but it should also be in a state of very fine division, so as not to be wetting in character. (12.) A spray producer, to be serviceable, should not only work for a considerable time (say two hours) without needing replenishing, but it should do so at a much lower pressure than that for which the instrument was tested, so as to be free from all danger of explosion.

Having then selected a spray, and having borne these points in mind, the next thing is to manage it; and before I allude to the matters that require attention, I would say let every one make himself thoroughly acquainted with the mechanism and structure of the apparatus he is going to handle before he

attempts to set it in working order. The reason why steam sprays get out of order so frequently is, that they are handled by those who know very little about their arrangement and construction, and won't take the trouble to learn. In private practice each surgeon looks after his own instrument; but in hospital work it is different, and I believe that the best plan is to appoint a clerk or dresser to have charge of the sprays, and be responsible for their proper working, or else this duty might be handed over to the sister in charge of the ward. I know instances where this latter arrangement was made, and it was found to answer very well. In the working of a steam spray the following directions should be followed out:—(1.) The strength of the carbolic lotion employed with a steam spray should be filtered 1-20. This, mingling with the steam, yields a vapour consisting of one part of carbolic acid to about thirty parts of water, which is a reliable spray. That is the strength Mr. Lister advises. “The spray consists of the 1-20 solution of carbolic acid mixed with the vapour of boiling water.” (*Dublin Journal of Medical Science*, August, 1879.) (2.) To save time in getting up steam, use clean hot water. (3.) Fill the boiler up to the base of the dome, never above it. (4.) Allow about 12 oz. of water for each hour's use. (5.) Before lighting the lamp always see that there is sufficiency of spirit in it. (6.) Steam may be considered up when, on opening the stop-cock, it rushes out for a considerable distance and is of a blue colour. (7.) As soon as the suction tube is placed in the carbolic acid, the spray should change from a blue to a white colour. This is the indication that we are dealing with a spray containing carbolic acid, and not steam alone. This is a matter of considerable importance and should always be attended to. Besides the colour, we have also the rushing sound, the smell, and the taste to guide us in ascertaining the presence of carbolic acid in the spray. (8.) See that the tube which conveys the solution has a piece of sponge in it to filter the fluid and prevent the fine steam point being blocked with any particles. (9.) When steam is up, press upon the lever of the safety valve to see that it is working properly. (10.) If the spray is working well and much steam escapes from safety valve (unless it is out of order), it shows more is being made than is required, and the flame of the lamp should be lowered. (11.) If much steam escapes from safety valve, and there is no pressure to cause suction at the jet, it will at once show that the jet is choked, and the lamp should be lowered and steps taken to remove the obstruction. (12.) The best way to remove any obstruction is to unscrew the points and pass

through them, *not pins*, but a horse hair or fine metal wire. It is on occasions such as this that the value of two jets to the spray, or of having a spare pair of points to affix is seen. (13.) On the slightest threatening of the spray going wrong, place on the wound the "guard" properly soaked in carbolic lotion. (14.) During an operation one person should be told off to attend to the spray, and he should see that the antiseptic cloud envelops the wound, does not incommod the surgeon, or play upon the patient's mouth, so as to necessitate its being respired. He should also see that there are no draughts from open windows or doors to blow the spray about, and that the spray bottle is replenished with carbolic lotion from time to time. Should ether happen to be the anaesthetic, he will avoid bringing the lamp near it in case of igniting it. (15.) When the spray is no longer needed, the lamp should be extinguished, the superfluous steam blown off, and the boiler emptied, care being taken not to let the water flow into the steam pipe. Such I regard as the chief matters of detail to be attended to in dealing with the steam sprays, and if they were carried out and these instruments no longer regarded as innocent toys, but as complicated and important pieces of mechanism requiring care and intelligence on the part of those dealing with them, we should no longer have the haphazard performances that occur so frequently and mar the safety and quietness of an antiseptic operation. I know many objections have been urged against the spray, and some have tried to do without it, but its necessity is now clearly recognised, if we want *certainty* in our cases, and the objections have been found more or less groundless.

During the conduct of an operation or the changing of dressings, it is customary to place the spray on a table or any other article of furniture, but Messrs. Allen & Son, 64 Marylebone Lane, have constructed, at the suggestion of Mr. Berkeley Hill, a very convenient table for holding the spray. It is seen in Fig. 18. It is mounted on castors, and at the lower part between the legs is a tray for holding bottles, &c., while above is a tray into which the stand of the instrument is securely fixed. This upper tray can be raised or lowered to the height required for the operating table or for dressing beside

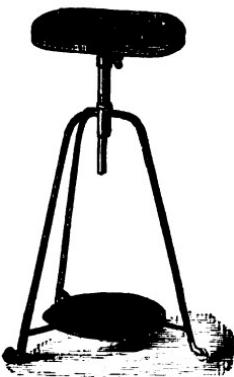


FIG. 18.

the bed. It can also be turned horizontally in any direction. The stand can be wheeled from bed to bed, or ward to ward without any noise, as the castors are covered with india-rubber. Those who have tried it speak of it as being very safe and useful. Its price is forty shillings—japanned. In the Western Infirmary, Glasgow, they use in the operating theatre a very similar stand, only it is made of wood and is not so handy.

This brings me to the end of my papers on the materials and apparatus used in Lister's system, and I think I have omitted nothing that he advocates. Undoubtedly, the method of dressing is somewhat complicated, and necessitates the surgeon or general practitioner carrying about with him a variety of things. From time to time surgeons have had



FIG. 19.

constructed for their own immediate wants a case to hold these different articles, but they have not specially devised anything that they have thought worthy of bringing under the general notice of the profession. Very recently, however, a surgeon's and general practitioner's bag, for the practice of antiseptic surgery, has been designed by Mr. O. D. Marriott, of Sevenoaks. The accompanying illustration, Fig. 19, indicates the combination of a tin case and leather bag, so arranged

that the former contains steam spray apparatus and all the materials required for antiseptic practice, such as carbolic acid and carbolised gauze, which requires an air-tight enclosure to ensure its keeping its strength. This case glides into a compartment of the bag and is secured by straps, a false bottom forming the roof of this compartment, while the space above is available for instruments and dressing materials, which are not of a volatile character, such as boric lint, protective, &c. Its dimensions are 16 in. by 10 in, and greatest height 12 in. In Fig. 20 is seen the tin case with a steam spray. The bag with tin case is made by Messrs. John Pound & Co., 81, 82, 83 Leadenhall Street, London, E.C., where one can be seen.

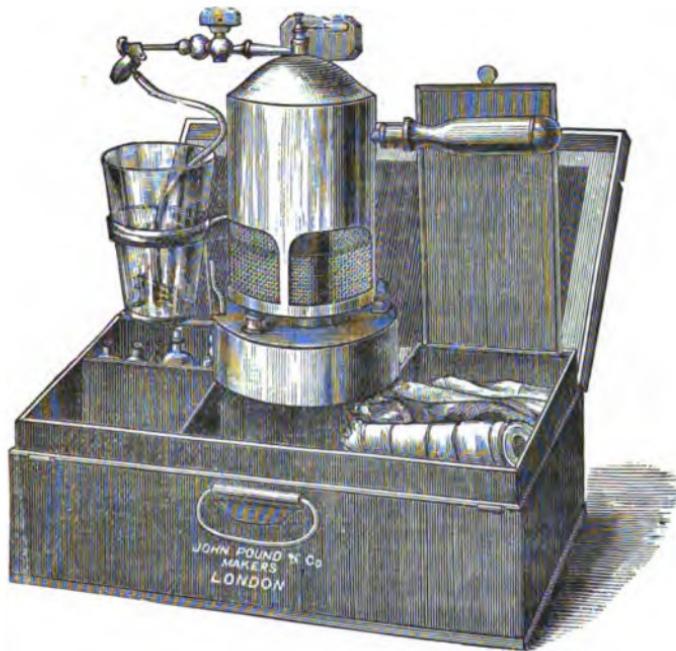


FIG. 20.

Its cost by itself is £3, 5s., but if fitted up with all requisites and with a steam spray of full size, made by Marr or Matthews, about £10, 10s. It may be mentioned that the bag has been submitted to Mr. Lister, and has met with his cordial approval.

To recapitulate, then, in conclusion, I would direct attention to the following points:—

(1.) There are two methods of atomising liquids containing substances in solution.

(2.) One method is founded on mechanical division of the fluid into minute particles by forcibly impelling it against a resisting substance.

(3.) The other method is to incorporate the liquid to be divided with a jet of air driven through a narrow orifice.

(4.) M. Auphan was the first to try the mechanical plan, but the idea received considerable development in the *portable inhalation apparatus* of Sales-Giron.

(5.) Mathieu of Paris, on the other hand, was the first to illustrate the second plan of pulverising fluids, he having brought out an apparatus for this purpose driven by compressed air.

(6.) The next important improvement in Mathieu's idea was made by Dr. Bergson of Germany, who introduced his glass tubes placed at right angles, one to the other and worked by a hand bellows.

(7.) This was followed two years afterwards by Dr. Siegle substituting steam for atmospheric air as the motor power for working these Bergson's tubes, the idea being patented.

(8.) Dr. Waldenburg had previously, however, suggested the use of steam for pulverising fluids, but it is uncertain whether Siegle was aware of his publication.

(9.) Bergson's apparatus has been modified in several ways, and forms the basis of Clark's, Dewar's, Richardson's, and other spray producers, though it is right to say that by some Clark's instrument is held to have been the first ever furnished with *double hand bellows*, and so able to furnish a *continuous spray*.

(10.) At first Mr. Lister employed in his system a spray cloud furnished by instruments on the model of Richardson's, worked by hand or foot bellows.

(11.) With a view of obviating the necessity of an assistant to work the spray, he utilised Siegle's steam spray for furnishing an antiseptic atmosphere.

(12.) To meet however the requirements of surgical work it was found necessary to construct larger instruments.

(13.) These large antiseptic steam sprays are very serviceable, but they require care and intelligence in their management.

(14.) A very convenient bag for carrying about the *materia antiseptica* has been devised by Mr. Marriott and approved of by Mr. Lister.

(Concluded.)

EMBOLISM OF THE SUPERIOR MESENTERIC ARTERY.

By JOHN MOYES, M.B.,

Assistant to the Professor of Clinical Medicine in Glasgow University.

THE following paper was suggested by the occurrence of the case which forms its text, and by the small amount of information on the subject obtainable from the English works on Practice of Medicine. The lesion is a comparatively rare one, and in many of the recorded cases, where the *post-mortem* appearances are carefully described and argued from, the clinical history is meagre or altogether awanting.

CASE.—Robert Adam, engineer, aged 39, was admitted into Professor McCall Anderson's Wards in the Western Infirmary, on 6th December, 1879. He had been bedridden for eighteen weeks, suffering from severe cough, with occasional haemoptysis, shortness of breath, palpitation, weakness and dropsy of the lower limbs. These symptoms, with the exception of the haemoptysis, were all present on admission, and the following is a summary of the other facts then noted.

There was bulging in the precordial region, with pulsation and tenderness on pressure in the epigastrium. The apex beat was indistinctly felt in the nipple line. The sounds of the heart were very irregular, and a presystolic murmur was present, heard most distinctly over the apex. Respiration was hurried and shallow, and interrupted by frequent fits of coughing. The expectoration was mucous and frothy. The chest was barrel-shaped and hyper-resonant to percussion in front, but behind there was comparative dulness at the right base. Dry bronchitic râles were heard over the chest in front, and moist râles at the bases behind. The respiratory murmur and the râles were less distinct at the right base. The tongue was large and flabby, moist and marked at the edges by the teeth. Appetite was fair, and bowels regular. There was slight fulness in the region of the liver which was enlarged, measuring six inches in the nipple line. Urine was scanty, of high sp. gr., but no albumen was present. Temperature normal. There was no history of rheumatism.

The treatment was directed chiefly to relieve the more urgent symptoms—viz., the dropsy, the cough, and the difficulty of breathing.

On 6th January, a month after admission, it is noted that the patient is very much improved; the swelling of his legs

has completely disappeared ; the cough is less troublesome, and the expectoration less abundant and more easily got rid of ; he can take his food very well. The following notes are condensed from the Ward Journal.

25th January.—For the last three or four days the patient has been complaining of pain across his abdomen, just below the borders of the ribs, and of slight pain in his back, in the region of the kidneys, especially the left. To-day he complained that the pain in his abdomen was worse, and to-night he was seized with violent gripping pain in that region. It came in paroxysms of a few minutes at a time, occurring about every half-hour, and leaving in the interval the duller pain before mentioned. The abdomen was quite normal in appearance ; pressure relieved the pain while the paroxysm was present. There was no distension, and no tenderness on palpation. No signs of hernia were present. Slight vomiting occurred, but the matters ejected consisted only of the food. He had no diarrhoea. His bowels had been regular enough previously.

26th January.—Patient is no way improved, and he has had diarrhoea during the night. He would not rest sufficiently long in one position to allow of his temperature being taken, but judged by the hand it is not at all elevated. A draught, with a few minims of carbolic acid and sulphuric ether was given in peppermint water, and half a grain of the acetate of morphia was injected subcutaneously.

27th January.—The symptoms remain as before, except that the diarrhoea has increased, and the vomited matter is now black and very fluid. The morphia was repeated in the evening.

28th January.—After the subcutaneous injection he slept for about six hours, awakening about 2 A.M. From this time he grew rapidly worse ; the vomiting became profuse, and what was ejected was chiefly altered blood, but the diarrhoea was not increased, and no blood was observed in the stools ; there was great pallor of the face and surface of the body, and he died in the early morning (6 A.M.) while in the act of vomiting.

The following is the report of the *post-mortem* examination, which was made by Dr. Joseph Coats upon the 30th January.

External appearances present nothing remarkable.

Chest.—The heart is considerably enlarged, weighing $17\frac{1}{4}$ oz. The enlargement is mainly, if not entirely, of the right ventricle and auricle. The aortic valve is competent, and the curtains are normal. The mitral valve is greatly altered, the curtains are coalesced and rigid, and there is frequent massive

deposition of lime salts in the thickened valvular tissue. At one place there is a rough ragged surface, as if a piece of calcareous material had been recently carried away. The mitral orifice is displaced downwards by the coalescence of the curtains, and only admits one finger. In the left auricular appendage there are several globular vegetations, one of considerable size and rather loosely attached. The left auricle is considerably distended, and its wall thickened. The right ventricle is greatly enlarged, and the muscular wall is firm and of considerable thickness. The tricuspid orifice admits readily six or seven fingers, being markedly dilated. The auricle is also enlarged. There are no thrombi in the right ventricle or auricle. The lungs are non-adherent. There is hypostatic engorgement and oedema of both, and a quantity of dirty mucus is found in the bronchial tubes.

Abdomen.—The folds of intestine are at once seen to present a frequent dark red appearance, and they are occasionally glued together by very soft recent fibrinous exudation. The red colour of the intestine is present mostly in the ascending colon and ileum, but also to some extent in the jejunum. The redness stops rather abruptly near the beginning of the transverse colon, only an inch or two of it being affected. The mesentery of this part of colon is also dark red in parts. On removing and opening the intestine, a dark brown pulaceous material is found in the ascending colon, whose mucous membrane is of a very dark red colour, and remarkably soft. The dark red colour is nearly uniform, but there are darker blotches. The ileum contains a semi-fluid material in large quantity, which has a reddish colour, and is obviously altered blood; this material is present more or less throughout the ileum. The mucous membrane of the ileum is in parts of a dark red colour, and exceedingly soft and friable; in fact, the appearance is very suggestive of that of the bowel when rendered gangrenous or nearly so by strangulation. The mucous membrane chiefly, but also the other coats are infiltrated with blood, and the former is in parts nearly diffused. This condition is not marked at the extreme lower end of the ileum, but a little up from that it begins to be very marked, and continues so throughout the ileum. In the jejunum there is slaty coloured semi-fluid faeces, and the mucous membrane occasionally presents a red colour and slight infiltration with blood.

On examining the superior mesenteric artery, it is found plugged and distended. The situation of the plug is just where the colica dextra is being given off, a portion of the

plug passing into and distending this branch for a certain distance. The parts of intestine supplied by the plugged portion of the artery are—the ascending colon (probably a part also of the transverse), the ileum, and possibly the lower part of jejunum. The arteries to the upper part of jejunum are free, and so are the pancreatico-duodenalis inferior, and colica media.

The spleen is normal in size, or slightly enlarged, weighing $5\frac{1}{2}$ oz. It contains a small infarction of a red colour. The left kidney weighs 6 oz. It contains several infarctions—two of large dimensions and cheesy, two or three small and having the appearance of clots of blood in the kidney substance. The right kidney weighs $4\frac{1}{2}$ oz., and appears to be normal. The liver weighs 54 oz., and presents nothing remarkable.

In a work published as far back as 1843, Tiedemann mentions several cases in which, at the autopsy, this artery was found completely occluded by coagulated fibrin, but as the bowel was uninjured, being nourished by the inferior mesenteric and the greatly enlarged pancreatico-duodenalis, it may be assumed that, in these cases, the closure took place by degrees. Virchow first described the characteristic *post-mortem* appearances which follow this lesion in a record of three interesting cases. He was followed by Beckmann in 1858, Cohn in 1860, who first prefaced the *post-mortem* account with the clinical history, and Oppolzer in 1862. Gerhardt and Kussmaul, in publishing two cases in the *Würzburger Medicinische Zeitschrift*, 1863 and 1864, gathered up the known clinical facts, and gave the following points as the most important in establishing the diagnosis:—

1. A source exists from which the embolus might be derived.
2. Profuse, even exhaustive intestinal hemorrhage sets in, which ~~may~~ due either to a ~~severe~~ injury to the ~~mucous~~ membranes of the bowel, or to the hindrance of the mesenteric circulation.
3. There is a considerable and rapid fall in the temperature.
4. Pain in the abdomen is present, which may resemble colic and be very severe.
5. Tension and tympanitic swelling of the abdomen occur at last, and there may be fluid in the peritoneum.
6. Evidence of embolism of other arteries having taken place either before or at the same time as the superior mesenteric may be present.
7. Palpation may reveal the presence of collections of blood between the folds of the mesentery.

These suggest a convenient order in which to arrange the following remarks.

As regards the source of the embolus, the presence of mitral stenosis was in this case recognised during life, and at the autopsy the valve was found so narrowed as only to admit one finger. The curtains were coalesced, and there was frequent massive deposition of lime salts. *At one place there was a rough ragged surface, as if a piece of calcareous material had been recently carried away.* The left heart is by far the most frequent source of the embolus. Out of 23 cases which we have gone over, it was derived from this source in 19, of these, 5 were the subjects of mitral insufficiency, 3 of mitral stenosis, 9 of endocarditis with fibrinous deposit, and in 2 the condition is not specified. Of the remaining 4 cases, in one described by Virchow, the embolus was derived from thrombosis of the veins of the lung, following on a haemorrhagic infarction; in another, described by Cohn, the patient was the subject of secondary syphilis, and the embolus was derived from the aorta, in which, at the autopsy a spot was found of about the size of a sixpenny piece covered with fresh warty looking coagulated fibrin, upon the removal of which a small ulcerated surface came to view. In the other two cases there was sclerosis of the aorta with, in one of them, thrombi attached to the wall.

The intestinal haemorrhage occurs in almost every case, for although, as in our case, death may ensue before any change in the colour of the stools is observed, or any blood has passed the anus, the autopsy will nevertheless usually reveal its presence in the bowel. The cause of this haemorrhage, or rather the mode of its production, has received much attention from writers on the subject; and in the comparative rarity of the lesion in the human subject, recourse has been frequently had to experiments on animals in searching for the explanation. As our concern is more with the clinical aspects of the subject, it will suffice to mention here that the haemorrhage with the infiltration of the mesentery and of the coats of the bowel and the gangrenous condition of the latter, are phenomena quite analogous to those which take place in embolisms of organs supplied by "end arteries"—phenomena to which the name of haemorrhagic infarction has been given. If it be objected to this, that the superior mesenteric is not an "end artery," but anastomoses with the pancreatico-duodenal above and with the inferior mesenteric below, the answer will be found in the exhaustive series of experiments carried through by Litten, and detailed in Virchow's *Archiv*

for 1875. He has placed it beyond doubt that, although not anatomically, the superior mesenteric is *functionally* an "end artery," and he finds the explanation of this in the great length of the artery, the extent of tissue supplied by it, and the comparative smallness of the vessels with which it anastomoses on the borders of its territory. The collateral circulation is thus so long in being established that ample time is allowed for those disturbances of nutrition in the walls of the vessels which render them permeable and allow the blood to escape.

The occurrence of this haemorrhage underlies and accounts for many of the clinical facts noted in this and other cases. Among these may be placed pallor of the face and surface of the body, the considerable and rapid fall of the temperature, syncope, which may be a prominent and distressing symptom, as in cases related by Cohn, Feltz, and Hirtz—haematemesis, diarrhoea, and melæna. The two last are important though not constant symptoms, and, indeed, there is some reason for supposing that the first effect of the embolism is to paralyse the bowel and prevent peristaltic action. Diarrhoea, even with blood in the stools, may be met with in cases of heart disease, apart from this lesion. Dr. Balfour* mentions that occasionally, in the later stages of cardiac disease, we have a "sero-mucous diarrhoea, which the patients are prone to term dysentery;" and Dr. James Finlayson has communicated to us a case in which the patient had dysenteric symptoms, but in which, though embolisms of other organs were found at the autopsy, nothing was discovered in any of the branches of the mesenteric arteries. On the other hand, it has long been known that minute embolisms of this artery may cause haemorrhage, with ulceration and even gangrene of small portions of the bowel, and Parenzki has detailed five cases in which the dependence of such ulceration and gangrene upon these embolisms was verified at the *post-mortem* examination. To decide during life, whether slight haemorrhages from the bowel be due to congestion or to these embolisms, would be difficult, and were it possible, would be unimportant; but the graver question has been raised by M. Lereboullet—viz., whether other and more profuse haemorrhages, to which it has been customary to assign an idiopathic origin, or to explain by supposing an organic lesion of the stomach or intestine may not be due to a vascular rupture, consequent upon occlusion of one of these vessels.

From a consideration of cases in which diarrhoea or melæna has occurred, we learn that there may be (1) pro-

* *Diseases of the Heart.* By G. W. Balfour. Page 262.

fuse diarrhoeal evacuations, the stools remaining of their natural colour, as in this case, and one related by Ponfick; or (2) that considerable bleeding may take place from the rectum at first, followed by a slower and continuous passage of tarry-like masses (Gerhardt); or (3) the stools may be of pulpy consistence, mixed with blood, or consisting entirely of tarry-like blood; or lastly, profuse haemorrhage may take place, the stools resembling tar water. The state of the blood passed has been supposed to furnish the principal indication by which the seat of the lesion may be determined. If the blood be decomposed, the superior mesenteric is occluded, while if fresh, the inferior is indicated; but this statement receives but feeble support from the case related by Hegar, of embolism of the inferior mesenteric, in which the stools were foul smelling throughout, becoming increasingly so towards the close. M. Bertrand, again, tries to show, from the character of the stools, that the course of these cases is marked by two stages, the first, or *période d'oblitération*, in which the stools are fresh, indicating that gangrene of the bowel has not yet taken place; and the second, or *période de perforation*, in which they are decomposing and offensive, from the bowel having become gangrenous. Gerhardt avers that he has been able, by the aid of the speculum, to see the blood oozing from the mucous membrane of the rectum in a case of embolism of the inferior mesenteric; and in Hegar's case there was found a deep injection of the rectum, which might have been perceived during life had the patient been submitted to such an examination.

Vomiting, which is a frequent symptom, was present in our case, and on the day before death the vomit was observed to be black and very fluid, in short, to contain altered blood. In one of the cases above cited, in which the intestinal haemorrhage was also very profuse, the patient vomited as much as three pounds of blood. Haematemesis was also present in M. Lereboullet's case.

The fall in the temperature was not verified by the thermometer, owing to the restlessness of our patient.

Pain in the abdomen was the first symptom in this case, and remained the most prominent throughout. For two or three days he complained of a dull aching just below the borders of the ribs, and on the 25th January there was superadded severe paroxysmal pain, in all respects resembling colic, even to the relief afforded by pressure. The occurrence of this in cases where embolism might happen ought to place

the observer on the watch for other symptoms, and though insufficient of itself to establish a diagnosis of embolism, the presence of a colic resisting treatment in the course of cardiac disease justifies the suspicion that this may be the case. In illustration of this we may refer to the January number of this *Journal*, for 1874,* where a case of "embolism of renal, cerebral, radial, and *probably other arteries*," is recorded, in which it is noted that during the course of the ailment "shiverings with abdominal pains occurred, leading the patient to lie with her legs drawn up," and twenty days later, "another severe shivering, with slight pains in the lower and left portion of the abdomen, likewise occurred, without any urinary changes being observable." The situation of the abdominal pain has also been called in to assist in locating the embolus. When the superior mesenteric is involved, it is usually near or above the umbilicus (in Oppolzer's case it was in the lumbar region); whereas Hegar, in remarking upon his case, lays great weight upon the tenderness to pressure being limited to the sigmoid flexure and descending colon; and in a case reported by Hochard, the patient complained of an itching and burning near the anus, raising the suspicion that the inferior mesenteric was the occluded artery.

There was in our case no increase of tension or tympanitic swelling of the abdomen, neither was there any evidence of fluid in the peritoneum. These are late symptoms, and indicate the advent of peritonitis.

The only fact pointing to other embolisms taking place was the pain complained of in the region of the kidneys, especially the left. No great stress was laid upon this at the time as indicating anything special, as it was unaccompanied by any change in the urine, which remained non-albuminous throughout; but this pain acquired a new significance when, at the autopsy, the left kidney was found to weigh six ounces, and to contain several infarctions. Two of these were of large dimensions, and cheesy, two or three small, and having the appearance of clots of blood in the kidney substance. The spleen also contained a small infarction.

No collection of blood in the folds of the mesentery was made out during life, nor was any found after death. The symptom is a rare one; but occurred in two of the cases related by Cohn. In one of these, at the autopsy, a large blue tumour

* Report on Renal Cases observed in Professor Gairdner's clinique, during 1872-73, by James Finlayson, M.D.

came to view in the neighbourhood of the ileum, and proved to be of this nature. No mention is made of its having been observed during life. The other case is one of such great interest, as bearing upon the subject, that we cite it shortly here.

"A widow, 45 years of age, was admitted into the hospital on account of an inflammation of the lung. She had, besides, signs of mitral insufficiency. On her admission notice was taken of a convolution of hard knots, slightly painful, lying along the transverse colon, somewhat like the configuration of the pancreas, movable and not pulsating. The knots remained in spite of a diarrhoea, but by and bye became smaller and less painful, and at last disappeared. Of their origin, the patient could give no account. She recovered so far as to take a walk in the garden, but caught cold, took an acute bronchitis and died. At the autopsy, in addition to the other lesions, one of the colic branches of the superior mesenteric was found closed by an embolus—before and behind the embolus the artery was empty, and the walls intact. *There were also traces of an earlier haemorrhage, with a thickening of the omentum, limited to the part supplied by the branch.*"

The prognosis in embolism of the superior mesenteric artery, though not absolutely bad, is exceedingly grave; but, in pronouncing in regard to it, it must be borne in mind that the symptoms of occlusion of one of the large branches are similar to those where the main stem is involved, while the probabilities of recovery are much greater. We have met no recorded cases, except the early ones of Tiedemann, where, at the *post-mortem*, it was found that recovery had followed occlusion of the main stem, and these, for the reason before stated, must be left out of account. On the other hand, there is evidence that recovery from the immediate effects may take place even where the ulceration has been so great as to cause complete closure of the intestine through cicatrisation.* There are on record at least three cases of recovery, where occlusion of the main stem was supposed to have taken place; but inasmuch as the situation of the embolus cannot be determined with certainty if the patient recovers, these cases are open to the suspicion that one or more of the larger branches only were occluded, and, indeed, both in Moos' case and Lereboullet's there were successive haemorrhages with intervals between,

* This occurred in a case related by Parenki, where the patient was operated on for stricture of the bowel, and only at the autopsy was it discovered that the stricture was due to cicatrisation, from ulceration caused by embolism of one of the branches of the superior mesenteric.

a fact favouring this supposition. The profuseness of the haemorrhage, though it may imperil the life of the patient from exhaustion, bears no constant relation to the gravity of the case. Copious and repeated haemorrhages took place in the cases of recovery, whereas, our own and others where this symptom was absent, had a fatal issue. Extreme fetor of the stools must be regarded as of evil omen, as this may be the evidence that gangrene of the bowel has taken place.

The importance of establishing the diagnosis is seen when we consider the treatment. One of the first symptoms calling for relief is the pain resembling colic, which might readily be mistaken for a genuine attack of that malady. But the ordinary method of relieving the pain of colic by the application of hot fomentations or poultices is inadmissible here, as this course would encourage the intestinal haemorrhage. In any doubtful case, therefore, relief should rather be sought for in the administration of morphia subcutaneously or by suppository. If the diagnosis be established attention should be directed to restraining the haemorrhage. In this, also, caution must be exercised, as the lowering of the heart's action by sedatives or otherwise is contra-indicated. This becomes plain when we consider that their use would lower the pressure of the blood, and it has been proved that one of the causes of gangrene of the bowel is that the pressure is unequal to establishing the collateral circulation within a time sufficient to preserve the integrity of the tissue. It were better, therefore, only to employ such simple means as the application of ice to the abdomen or astringent injections into the rectum.

The following references may be found useful by those interested in the subject. In all cases where it was possible, the original papers have been consulted; but in some instances recourse has been had to reviews or year books.

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CURRENT TOPICS.

DR. HALL AND THE COMMISSIONERS OF THE BURGH OF GOVANHILL.—Some of our readers may have observed, in the *Glasgow Herald* of 6th November, a letter from Dr. Andrew

J. Hall, stating the circumstances under which he had resigned his appointment as "Medical Officer of the Burgh of Govanhill." These are so extraordinary that it seems well that the profession should be made fully aware of their nature. We have been favoured by Dr. Hall with a perusal of the correspondence which preceded his resignation, and the following are the facts:—The *Police Commissioners* of this burgh are, by statute, the Local Authority under the Public Health (Scotland) Act. By the 8th section of that Act they are empowered, and may also be required by the Board of Supervision, to appoint "a Medical Officer or Medical Officers," "for the purposes of this Act," whose duties *may* be regulated by bye-laws, which are not effectual until they are approved by the Board. On 10th January, 1878, Dr. Hall was notified by the Clerk to the Commissioners that he had been appointed "Medical Officer of the Burgh of Govanhill," at a salary of £12 per annum, "to cover all consultations, inspections, and other charges." Nothing emerged to disabuse Dr. Hall of the impression, sanctioned by the straightforward interpretation of the terms of his appointment, as well as by general usage, that he was Medical Officer of the Commissioners as Local Authority under the Public Health Act, until the summer of the current year. He was then asked by the Procurator Fiscal of the burgh to examine and report upon the state of the prisoner in a case of assault, and of the parties assaulted. He did so, and rendered an account for the small fee of 10s. He thereupon received from the Clerk to the Commissioners a letter intimating that, while this charge would be paid, such fees could not in future be allowed, as such duties were covered by his appointment and salary. Dr. Hall replied that he regarded his appointment as under the Public Health Act, and his duties as only those falling within the purposes of that Act. The Commissioners adhering to their view of the office, Dr. Hall submitted the case to the Board of Supervision, directing their attention to the fact, which he had in the interim discovered, that his salary was returned to the Board as part of their expenditure under the Public Health Act. In accordance with their invariable practice, this communication was remitted by the Board to the Commissioners for their remarks. Those remarks were to the effect that the Public Health Act had never been mentioned in connection with the appointment. Dr. Hall had been designated "Medical Officer of the Burgh, . . . it being the intention of the Commissioners that the appointment and salary were to include and cover whatever medical advice they might require

for any Burghal purpose whatever." This reply was sent to Dr. Hall for his remarks, in which he pled common usage of the phrase "Medical Officer of the Burgh," as against "the intention of the Commissioners," that it should embrace the duties of Police Surgeon or any other than those falling within the Public Health Act, in which Act alone the words "Medical Officer" occur, and out of assessments leviable under which Act his salary was paid. He refers to an advertisement for a "Medical Officer wanted for Kinning Park Burgh," under which Dr. Dougall was appointed, who is paid by additional fee for Police duties, and he ends with this very pertinent question—"If Mr. Robertson [Clerk to the Commissioners] is under the belief that the £12 annually paid to me covers whatever medical advice the Commissioners might require for any Burghal purpose, why does he return that sum as my salary for work done under the 'Public Health Act?'" The final deliverance of the Board was probably the only one open to them in the circumstances—"that the terms and conditions of your appointment, in the event of a difference of opinion arising between you and the Police Commissioners, can only be settled in a court of law." Dr. Hall very naturally did not see the advantage of entering a court of law and disturbing his mind for an indefinite period over a question, his interest in which amounted to such a miserable sum as £12. The fact is, that under the advice of their Clerk, the Commissioners of Govanhill wish to play a discreditable game of hocus-pocus with the profession. They pose in two capacities—as Police Commissioners and as Local Authority under the Public Health Act. In the latter capacity they appoint a "Medical Officer," whom they pay out of monies levied under that Act for the purposes of that Act. In the former capacity they ask him to do certain duties in furtherance of the purposes of another Act, with distinct powers of assessment. The poor doctor is expected to be bewildered by the fact that in both capacities he recognises the same Commissioners—the same Clerk. That the trick is gone about with deliberation, and full apprehension of its nature, is evident from the following extract from the report of the meeting at which Dr. Hall's resignation was accepted, as it appears in the *Glasgow Herald*, 11th November:—"The Finance Committee, in their minutes, reported that a letter had been received from Dr. Hall, in which he resigned his position as Medical Officer for the Burgh. The Committee recommended that the resignation be accepted, and that another officer be advertised for at the same salary, and for

the same duties. A considerable diversity of opinion was expressed as to what the duties of a Medical Officer were. Mr. Sutherland wished the engagement to be more definite, and Mr. Steele suggested that the new officer should be appointed under the Medical (*sic*) Health Act, and all other duties should be paid for in addition. This would make the duties definite. *Mr. Robertson said that it was dangerous to enter into particulars. Their last engagement was drawn in such an indefinite way that they could scarcely conceive any duty which it would not cover. It was agreed to determine the terms of engagement after applications had been received.*"

We gladly advertise, in this way, without charge, the wants of the Commissioners of the Burgh of Govanhill. If any member of the profession feels disposed to serve a body of men who proclaim so unblushingly their sense of the "danger of particulars," we would direct his attention to that clause of the 8th section of the Public Health Act, in which power is conferred "to make Bye-laws for regulating the duties of Medical Officers, which Bye-laws shall not be effectual until they are approved by the Board." Bye-laws consist of those "particulars" in which the Clerk sees so much "danger," and no one should on any account accept the office until they are produced, and let all other "Burghal purposes" form the subject of a separate agreement. In the 28th Annual Report of the Board of Supervision, p. 50, will be found the Bye-laws recommended by the Board, which, while strictly defining the duties of "Medical Officer" from all others, give an amplitude to the scope of those duties which it would be well that this impecunious and somewhat shifty Burgh should learn.

THE GLASGOW HOSPITAL AND DISPENSARY FOR DISEASES OF THE EAR.—On Wednesday, 27th October, this institution was formally opened by its President, Dr. Andrew Buchanan, late President of the Faculty of Physicians and Surgeons, in the presence of a number of its patrons, directors, medical staff, and well wishers. In 1872, Dr. Cassells, our well known aural surgeon, founded a Dispensary for Ear Diseases in the upper flat of these premises for the requirements of poor out-door patients. At first it was commenced on a very small scale, but owing to the untiring and self-denying zeal of Dr. Cassells, ably assisted by Mrs. Henderson, the first matron of the institution, it soon began to thrive, and thus in 1880, eight years after its foundation, we find it in a most flourishing condition ; and when we say that yearly upwards of 3,000 cases

of ear disease come under treatment, we may safely let these figures speak for themselves. Throughout the whole of this period Dr. Cassells treated all these cases with his own hands, and even supported the young institution almost entirely out of his own private means. Encouraged by this success, he next conceived the idea of establishing a hospital in connection with the dispensary, by adding other portions of the premises to those already in use, as many serious cases of ear disease came under notice, which required the constant care of a hospital. He set about this task with vigour and enthusiasm, procuring every patron on its list, every director on its Board, and every medical man on its staff. A meeting of these gentlemen was called on the 12th May last, and the hospital in connection with the dispensary became an accomplished fact. It is, therefore, Dr. Cassells to whom all the honour is due, of having procured for Glasgow such an invaluable institution as the Hospital and Dispensary for Diseases of the Ear. The premises are excellently adapted for the purpose, and are converted into a comfortable and admirably equipped hospital, the different wards containing fifteen beds. There are also lecture and consulting rooms, a waiting room for the patients, a parlour, a dining room, a matron's room, kitchen, laundry, &c., all betokening great forethought on the part of the management. A special feature in the establishment is the telephone, which connects Dr. Cassells' residence with the institution, so that the latter gentleman, in case of need, may be informed of what is going on in his absence. Besides the matron, Mrs. Bickerton (who succeeded Mrs. Henderson after her voluntary retirement) and a dispenser, Dr. Cassells is aided in his labours by two clinical assistants. The hospital is always open for urgent cases, and patients, who desire to be admitted, have to communicate with the matron. Out-door patients are seen on Tuesdays, Wednesdays, Thursdays, and Fridays, from 2 to 4 P.M., by Dr. Cassells and his assistants.—*Communicated.*

REVIEWS.

Osteotomy, with an Inquiry into the Aetiology and Pathology of Knock-Knee, Bow-Leg, and other Osseous Deformities of the Lower Limbs. By WILLIAM MACEWEN, M.D. London: J. & A. Churchill. 1880.

OSTEOTOMY, in its present surgical development, is a thing of such recent date, that the present work is the earliest attempt

to give a complete and historical account of the subject. It is far from easy to estimate impartially the various methods that have been proposed, and the various diseases to which these should be applied, and it is only those who stand upon the advanced platform of Listerian beliefs regarding wound treatment, who can reason correctly regarding them. It may as well be said at once that Mr. Macewen has produced a creditable, impartial, and intelligible work, in which little of moment has been omitted. His language is that of boldness and honesty, and can nowhere be charged with being egotistical —although this might well have been pardoned in one whose name is so intimately connected with the osteotomy of to-day.

It would be both unprofitable and uncandid to dogmatise, in the present state of our knowledge, upon the causes at work in producing the deformities that call for the application of osteotomy. Such a subject can be treated satisfactorily only on one basis—viz., on well established and sufficiently extensive pathological and physiological facts. None of these do we now possess in such a full and clear condition as is indispensable. Volumes have been written, and controversies maintained, concerning rickets and static deformities, and doubtless we have not yet seen or heard the last of these. Rickets has been blamed for too much, and has been called into account for osseous faults where there was no proper evidence of its existence. To evade the difficulty, hypotheses have been advanced which were, to all save their authors, ludicrously inadequate to satisfy any mind that had the slightest pretence to being logical or truthful. Such theories as the contraction of the biceps tendon being the cause of knock-knee, or of its arising from weakness of the internal lateral ligament; or again, Sayre's theories concerning the production of lateral curvature of the spine, are lamentable proofs of the frequent inadequacy of renowned surgeons to reason in a common sense way concerning disease, and avoid the simple error of mistaking cause for effect. Few men have the courage to say, "I know not."

Mr. Macewen has steered well clear of such illogicalities, thanks, no doubt, to his robust Scottish good sense, and yet, after a perusal of the portion of his treatise where he deals with the causation of bony deformities in adolescents, we felt that we could have wished to see him a little less inclined to be dogmatic, and more willing to confess that there are gaps unfilled up. Mr. Macewen holds that rickets is the main cause of adolescent deformities, and has adduced original and careful observations in support of its being sometimes so, yet

the fact is not clearly enough realised that frequently, indeed usually, there is no evidence, save a weak analogy, in support of this being the case. Mr. Macewen has carefully studied the materials he disposed of, on purpose to improve the knowledge we previously had, and has furnished many new, full, and strikingly interesting chapters regarding the effects of chronic diseases, epidemic diseases, maternal health, &c., on the production of such deformities. Throughout this section, every page brings out clearly that weakening diseases and debilitating influences render the bones unable to resist normal pressures, and that hence they yield. But nowhere is there expressly mentioned the fact, unmistakably clear though it be, that the same results constantly follow from a converse cause. Weakness permits the bones to yield before normal forces, but surely we see daily that an increase of the normal forces, overwork, in other words, is amply sufficient to produce yielding of normal bones.

A child may be so fat that its own weight will induce flat-foot though its tarsal bones be normal. A boy or girl about puberty may have so much standing, walking, or carrying of burdens that a knock-knee results. These are no imaginary causes; the former is far from unknown, the latter so general that it furnishes more genua valga and flat feet than maternal influences, epidemic diseases, and weakening diseases added together. We have to object to Mr. Macewen's book that this is not clearly recognised, that hence results a deviation from nature and accuracy in his work, a fault which mars this division of his treatise. Perhaps we would not have insisted so strongly on this were it not that he has the largest personal statistics of any surgeon who has written on osteotomy in deformities, and hence his words and ideas will properly have great weight attached to them.

In the part of his work devoted to the treatment of deformities by osteotomy, Mr. Macewen is singularly just and impartial. He gives due prominence to the opinions and works of others who have also studied the subject, often in opposition to himself. His descriptions of the operations of others, and of his own operations, are very lucid and happy; not an ambiguous phrase or word mars the pleasure of the reader, and no second glance is needed to assist the understanding. The writing is here indeed excellent; and, though we may differ from him in some of his statements, it would be unfair to mix the praise which it must command with a hint of any unimportant personal difference of opinion.

We doubt if it was wise to incorporate in the work Dr. Foulis's well known investigations regarding the organisation of blood clot; we doubt even if it was just to Dr. Foulis to do so. That investigation is well and widely known on its own account, and its introduction but serves to make the book savour somewhat of a series of separate pamphlets, written at different times, with different objects, and with various degrees of care, cemented together in haste by a little fresh letterpress. Indeed, from many a page in the work we get the impression of its having been hastily got up; and we regret that justice compels our pointing this out. In page 18 a plural nominative agrees with a singular verb; in page 9 the past participle of the verb begin is called *began* ("when the distal extremities of the long bones have began to swell"); in page 17, "the child could not walk up till five years of age," &c. These evidences of haste either in writing or correcting proofs might have been avoided, and should have been avoided.

The defects of the work, however, are not of great magnitude, and will be noticed more by reviewers than by surgeons. We feel that, on the whole, the verdict of the profession regarding it will be an eminently favourable one.

Studies in Life: Lectures delivered in the Lecture Hall of the Young Men's Christian Association, London, October to December, 1879. By H. SINCLAIR PATERSON, M.D.

The Human Body and its Functions. Second Course of Lectures. By H. SINCLAIR PATERSON, M.D.

Health Studies. Third Course of Lectures. By H. SINCLAIR PATERSON, M.D. London: Hodder & Stoughton. 1880.

THESE three volumes, it will be noticed, represent three courses of Lectures delivered to the Young Men's Christian Association, London. They are thoroughly popular in character, and in this respect come less under our province as critics. But we must express our admiration for the manner in which the author has done his work. He has written simply and written accurately, because he knows how to write and understands thoroughly what he is writing about. The titles sufficiently indicate the nature of the subjects treated of, and if there is little in these volumes that is new to the professional reader, yet, from our own standpoint we can strongly recommend them to the notice of the young men of our city.

A Handbook of the Theory and Practice of Medicine. By F. T. ROBERTS, M.D., &c. Fourth Edition. Vol. II. London: H. K. Lewis.

THE production of a really comprehensive and good book on the practice of medicine must every year be getting more and more difficult. At present only systems of medicine seem to be sufficient to give anything like a complete view of the subject. So great indeed of late years has been the development and specialization of our art, that the practitioner who cares to be well informed in his profession must load the shelves of his library with special treatises on nearly every organ of the body. This is, no doubt, symptomatic of progress; and no science makes progress unless divided and subdivided so as to permit of the investigation or elaboration of every part. Still, we cannot help longing for the time when order shall be called out of the chaos—when the master mind shall come who will gather into one harmonious whole the opinions and practices which are truest and best. We remember how we used to appreciate Syme's *Principles of Surgery*, the principles which guided a great master, and which he set forth clearly and plainly for the benefit of others; and many a time we have wished that it were possible to have a book of a similar kind on the principles of medicine. Still, while the medical literature of the present day, in its abundance and in its incompleteness, represents too well the state of our art, we are glad to see appear such works as the well known *Manual* of Dr. Roberts. The fourth edition of such a book requires no commendation at our hands. It is admirably adapted to the wants more particularly of the student, who must find its arrangement and the manner in which the symptoms of allied diseases are tabulated very useful. In regard to the very important department of treatment, the advice is always sound and given with sufficient fullness to be of some real service to the young practitioner. We venture to hope that the value of these volumes will be still further increased in a future edition by an improvement in the quality of the woodcuts, and by the addition of a chapter on insanity, which subject has no necessary place in the studies of the student of medicine, so that if some little help be not given in such a work as this, he goes out into practice having a very imperfect notion as to what should be done when he is called to certify to the lunacy of a patient.

REPORTS OF HOSPITAL AND PRIVATE PRACTICE.

WESTERN INFIRMARY.

REPORTS UNDER THE SUPERVISION OF DR. W. G. DUN.

FROM DR. LEISHMAN'S WARDS.

(Temporarily under the care of DR. W. L. REID.)

FROM NOTES SUPPLIED BY MR. ERIC SINCLAIR.

PROLAPSE OF UTERUS AND BLADDER—GOOD RESULTS FROM OPERATION FOR RESTORATION OF PERINÆUM.—Mrs. G., aged 56, was admitted 11th August, 1880, suffering from prolapse of the uterus and bladder of four years' duration. On inspection, a large tumour could be seen projecting from the vulva and lying between the thighs. The main part of it was composed of the bladder, as was shown by passing the sound into it from the urethra. It could easily be replaced in the vagina, but soon prolapsed again when patient assumed the erect posture. The perinæum was so much stretched as to afford no support to any instrument which might be introduced; an attempt, indeed, had already been made in this direction, but had proved quite ineffectual. The patient was therefore advised to submit to operation.

On 12th August, chloroform having been administered, Dr. Reid proceeded to operate. A triangular flap of mucous membrane was first dissected from the posterior wall of the vagina with its apex downwards and the base about $1\frac{1}{2}$ in. up the vagina. The edges of the labia majora were then rawed, a strip of membrane about half-an-inch broad being dissected off as far forward as the urethra. The flap of mucous membrane first formed was then drawn forwards with the apex towards the urethra (the mucous surface being thus towards the vagina, and forming a floor to it), and the edges united to the mucous edges of the rawed surfaces with silk sutures. The opposing rawed surfaces of the labia were brought together by sutures of silver wire, the ends of which were guarded by india-rubber tubing.

During the operation, a stream of carbolic acid solution, 1 to 40, was kept flowing over the parts.

The after treatment consisted in confining the patient to bed with the legs fixed together in order to prevent the risk

of the perinæum being torn open. The bowels were moved cautiously at long intervals, and the parts syringed with carbolic acid solution every two hours at first, but later less frequently.

Union took place rapidly, no inflammation or suppuration being seen at any time. The silver sutures were removed in ten days, and the surfaces were found firmly united. Patient was able to be up and going about three weeks after the operation, but at first wore an external perinæal bandage. She was dismissed on September 24th, at which date the parts operated upon had quite consolidated, and the previously prolapsed organs were perfectly retained within the vagina, no external support being needed. She was seen again on 8th October, when the result was found still very satisfactory.

Remarks.—The flap of mucous membrane was intended to prevent the passage between the stitches of the fluids which usually collect in the vagina, this being well known as a cause of fistulous opening between the two farthest back sutures. The theory is that the edges of mucous membrane being neatly brought together while clearly visible and easily within reach would unite rapidly, and the gravity of mucus or pus would be prevented from doing mischief. Great weight is laid on the good effect of carbolic irrigation of the parts, before, during, and for some days after the operation till union is far advanced. During the operation it enables one to see exactly what the instruments are doing, the blood being rapidly washed away, the hæmorrhage is lessened, and the parts are kept sweet and clean, parts which, from their position, cannot be kept strictly antiseptic.

MALIGNANT DISEASE OF LABIUM—OPERATION WITH THERMO-CAUTERY.—Mrs. M'G., aged 69, was admitted 16th August, with a large epithelioma of the right labium. She complained of pain in the right iliac region and of foetid discharge from the tumour.

24th August.—To-day, while patient was under the influence of chloroform, Dr. Reid removed the whole of the right labium by means of the thermo-cautery, going some distance beyond the diseased tissues. No knife or other cutting instrument was used, but the cautery kept at a dull red heat, and it was found to answer the purpose remarkably well. Several vessels required to be ligatured during the operation, but the hæmorrhage was only slight. The parts were well syringed with carbolic acid, the lower part of the wound brought together with silver sutures, and carbolic oil dressings applied.

The catheter required to be used only during the first twenty-four hours after the operation. Little or no pain was complained of. On the second day the sutures gave way, and a granulating surface, as large as the palm of the hand, was left; as this healed it gradually contracted till, on September 21st, when patient left, it was much less than half the original size, and, though still of considerable extent, it had a healthy appearance with a healing margin. No trace of cancerous tissue was observable.

Patient was again seen on 1st October, when the surface was found to be almost entirely healed, only a minute point being still left. The cicatrix was remarkably small considering the size of the original wound. She expressed herself as free from pain and discomfort, and there was no discharge.

Remarks.—In this case the disease, reaching as it did some way up the vagina, would have been considered beyond the reach of operation with the knife. The patient did not suffer as the result of the operation, and is now free from pain, so that one would not regret having operated even although the disease should recur.

MALIGNANT DISEASE OF CERVIX UTERI—OPERATION WITH GALVANIC CAUTERY.—Mrs. S., aged 34, was admitted on 18th August. She presented an extremely anaemic appearance. She stated that in May last she stopped nursing, and that shortly after she began to menstruate. The menstrual periods, however, continued so long and the discharge was so excessive as quite to blanch her. In addition, there was a constant, profuse, foetid discharge, which latterly had become tinged with blood.

On vaginal examination, a cauliflower growth was found replacing in large part the cervix uteri, and of sufficient size to fill the vagina, though the vaginal tissue was still unaffected.

31st August.—To-day, by means of the galvanic ecraseur, the cervix was removed on a level with the roof of the vagina, and apparently at a point where the uterine tissues were still free from disease. A Grove's battery was used, six cells being sufficient to heat up perfectly and immediately a loop of platinum wire, 4 inches long, and considerably thicker than that commonly used. Pains were taken, by keeping a sound in the bladder, to avoid injury to that organ. One small vessel had to be ligatured, but the haemorrhage, as in the previous case, was trifling. The vagina was well washed with carbolic solution, and stuffed with oiled lint. The patient was

kept in bed for some days, and the vagina syringed out several times a day with carbolised water. There was no haemorrhage, and but little or no discharge.

Patient was dismissed on 16th September, when the wound was almost entirely healed, and looked quite healthy. She was seen again about a month later, when the parts were found quite healed, and apparently free from disease. There was no discharge, the canal of the cervix was patent, and no feeling of discomfort was complained of.

Remarks.—In a case operated on in this way some months ago, parts of the vagina were parboiled by the hot fluids from the neighbourhood of the wire. In the present case a finger was kept in the vagina, and as soon as it got uncomfortably warm, the electric current was shut off and the canal irrigated with cold carbolic water, the operation was then resumed, and advanced another step till the irrigation had to be repeated. The Grove's cells answered admirably, and not a moment was lost waiting on the heating of the wire. The thick platinum wire, although less liable to break, was more difficult to manipulate.

TWO CASES OF PARAMETRITIS.

CASE I. Parametritis with Tumour in Iliac Region rapidly Disappearing under Rest and Treatment.—Mrs. H., aged 27, was admitted 31st August. Five weeks before admission she was delivered of her third child. The labour was normal, and everything proceeded quite satisfactorily for three weeks, when, after a slight exposure to cold, she complained of pain in the left iliac and lumbar regions, accompanied by severe diarrhoea. There also was experienced, shortly after, some difficulty in micturition, a symptom which, to a minor degree, was still present on admission.

On external examination of the abdomen a swelling in the left iliac region was felt, firm, immovable, very tender, and almost the size of a foetal head, but much more smooth in its outline, and better defined than would usually be expected from spreading of inflammation in the cellular tissue.

On vaginal examination, the os and cervix uteri were found enlarged, and fixed in the pelvis in the midst of dense tissue, the whole vaginal roof being hard and very tender; the body of the uterus also was quite immovable. The sound passed easily to the normal depth.

Patient was kept in bed and fomentations applied to the swelling in the abdominal wall; vaginal injections of pretty

hot water were also employed, to the extent of a gallon twice a day, and a mixture containing iodide and bromide of potassium was ordered.

Under this treatment the abdominal swelling gradually became less, until, on 10th September, on which day patient left the hospital, it had almost entirely disappeared, only a little thickening of the tissues being left without any tenderness. The hardness of the vaginal roof had greatly diminished, and the tenderness here also was gone.

CASE II. Parametritis from Suppressed Menstruation.—Mrs. R., aged 34, was admitted 24th September. About three weeks before, after exposure to cold on the second day of menstruation, she had a chill accompanied by suppression of the discharge, and pains in her back and thighs, like "labour pains." When admitted she still complained of pain in these situations, not, however, so severe as when first experienced.

External abdominal examination revealed nothing except tenderness on deep pressure in the left iliac region. On vaginal examination the uterus was felt to be quite fixed in the cavity of the pelvis, the whole roof being hard and extremely tender on pressure. The uterine sound passed easily to slightly more than the normal depth, but any attempt to move the fundus gave rise to pain.

Temperature in axilla 102°2. Bowels costive.

In order to relieve the pain opiates were given, fomentations were applied regularly to the abdomen, and vaginal injections used as in the previous case. Considerable improvement soon took place, but the temperature continued rather high for about a fortnight; after this it sank to about normal, and the case was characterised by a progressive improvement in the symptoms. The troublesome pain ceased, and defæcation and micturition were performed quite naturally. The iliac tenderness disappeared, and, though some thickening in the roof of the vagina remained, no tenderness was felt even on firm pressure.

Remarks.—The satisfactory progress made by these cases shows well the value of rest as a remedial agent. The large vaginal injections were not employed for the purpose of cleansing, but with the view of supplementing the effect of the fomentations applied to the abdomen.

MEETINGS OF SOCIETIES.

GLASGOW SOUTHERN MEDICAL SOCIETY.

SESSION 1880-81.

SPECIAL MEETING, 20th OCTOBER, 1880.

MR. T. F. GILMOUR, *President, in the Chair.*

DR. E. DUNCAN, convener of the Hospital Committee, gave an account of the proceedings of that committee during the past two years. Soon after having been appointed in May, 1878, they had held a number of meetings, and had canvassed influential men and employers of labour on the South Side, who, in general, agreed that there was need of a hospital in the district, and promised their support to the movement. A site was also looked for, and several localities had been visited, when the failure of the City of Glasgow Bank rendered it advisable to stop further proceedings for the time. The movement was not again revived till after the death of Mr. Dixon, a short time ago, when it was found that if a hospital had been in existence at the time of his death it would have received £10,000. Mr. Dixon, also, in giving public halls to Crosshill and Govanhill, made it a condition that, should these burghs become joined to Glasgow, the halls should be sold, and the proceeds handed over to the proposed hospital. The Committee, on resuming their duties, appointed a sub-committee to make inquiry regarding a site. After various places, all more or less eligible, had been visited, it was found that the most suitable was Copelaw Hill, where there is a house with $1\frac{1}{2}$ acre of ground; while adjacent ground belonging to the Corporation of Glasgow could be had, at least at a reasonable price. The sum of money required for the purchase of the house and land would be £8,000. Lord Provost Ure was approached, and he expressed himself as of opinion that a hospital was wanted on the South Side, and promised to take an interest in the matter. Various public men on the South Side were visited, and they all seemed to be in favour of the movement.

Dr. Duncan then suggested that public bodies, such as town councils, parochial boards, and burgh commissioners should be asked to contribute. He understood the Glasgow Town Council was very much in favour of the scheme, and would

likely give a large subscription. He was of opinion that ultimately the movement would be successful.

Dr. Napier suggested that, before entering on a canvass, Dr. Duncan should issue a pamphlet explanatory of the whole matter.

Dr. A. L. Kelly agreed as to the necessity for a hospital; but he thought there would be difficulties in regard to the raising of money and deciding on a site.

Dr. R. W. Forrest thought the site should be near Govan, as he had been told that the horse ferry did not give very good access to the Western Infirmary, while the eastern portion of the South Side is well provided for by the Royal Infirmary—as far as accident cases are concerned; as for less urgent cases, patients go wherever they can gain admission. He also would not like to see subscriptions diverted from existing institutions, as the Western, especially, is now starving for want of funds. He made these remarks in no antagonism to the movement.

Mr. Park said, in regard to site, two objects should be kept in view—(1) healthfulness and salubrity; (2) convenience of approach from all districts, and particularly from those districts where the population is likely to increase. He considered Copelaw Hill the most suitable and convenient, as he thought the Govan shipbuilding yards would send to the Western Infirmary.

Mr. McMillan expressed his satisfaction with the report of Dr. Duncan, whose enthusiasm had prevented this movement dying a natural death. He agreed as to Copelaw Hill being the most suitable locality. He, too, thought there should be written a short pamphlet containing the history of the movement, and showing the necessity for such a hospital, and what is intended to be done. This should be sent to employers of labour.

Dr. Pollok said it had occurred to him that a dispensary should be started, and the necessity of a hospital proved by showing the number requiring indoor treatment.

Dr. Carr said that if the hospital were started it should be on an independent footing, with a directorate distinct from that of other infirmaries. It would then obtain the sympathy of South Side employers of labour more readily than if it were an offshoot of another hospital.

The President said the important questions were (1) site, (2) funds, (3) kind of hospital needed. He considered Copelaw Hill the best site. It forms an equilateral triangle with the two existing infirmaries. He did not anticipate there would

be much difficulty in getting enough money to start with. The hospital must be one capable of extension.

Dr. Duncan said that the question of site had been carefully discussed, and the necessities of outlying districts, as well as of the South Side of Glasgow, considered. The committee was of opinion that the hospital should not be too large. If afterwards found necessary there could be two hospitals on the South Side. It is not necessary to have £8,000 to commence with, as the trustees who hold the ground are willing to convert the price into a ground annual. As to the pecuniary condition of the two present infirmaries, during the last two years both of them have not only paid their way, but also accumulated capital. Two years ago the Royal had a capital of £82,000, now it has a capital of £105,000; and, while the Western had then £12,000 of a capital, it has now £15,000. In regard to the committee, he remarked it was for the Society to say if it should be continued.

The President thought there should be appointed a canvassing committee, consisting of the present committee, with other members added.

Dr. Napier proposed "That this Society take steps for the furtherance of the larger scheme laid before it—namely, the erection of a hospital and dispensary on the South Side of the city." This motion was unanimously adopted.

A committee was then appointed, to call on South Side employers and others to explain the scheme to them, and, if possible, to obtain their support; convener, Dr. E. Duncan.

M E D I C A L I T E M S.

UNDER THE DIRECTION OF

ALEX. NAPIER, M.D.

Treatment of Aortic Aneurism by Electro-Puncture.
—In treating aneurisms of the aorta by electro-puncture, Ciniselli, and the Italian surgeons generally, introduce both electrodes into the interior of the tumour; while, as a rule, the English and French surgeons introduce only the positive electrode. M. Teissier, in the present paper (*Bull. Gén. de Thérap.*, 15th November, 1880), defends the latter method of employing the electric current, and formulates the following propositions:—

1. As coagulation takes place only at the positive pole, the introduction of the negative pole into the aneurism is unnecessary.

2. Not only is the presence of the negative pole in the aneurism unnecessary, but its action is dangerous.

3. Clinical observations show that positive monopuncture is sufficient for the attainment of the object in view.

The first point needs little demonstration. The author has repeatedly shown by experiment, and it is generally admitted, that coagulation of the blood takes place only round the positive pole, and not at all at the negative pole.

The dangers to which the introduction of the negative pole gives rise are four—pain, the production of sloughs, haemorrhage, and cerebral accidents. Animals suffer extreme pain, and struggle violently when the two needles are allowed to touch each other in an artery. Considerable pain is experienced also in the human subject when the negative pole is represented by a large metallic plate fixed on the skin. Sloughing of the arterial walls in the vicinity of the negative pole is not prevented by Ciniselli's proceeding, which consists in first introducing the negative needle and bringing it into contact with the positive needle before connecting the former with the negative end of the battery. Haemorrhage is a necessary consequence of cauterisation of the arterial wall; it may occur at once, or some hours after, and has even caused death. Subsequent examination in these cases has shown invariably the same morbid changes; a well-defined ulcer or perforation, with blackened and sloughing edges, and beyond that a yellowish zone, all indicating profound alteration in the walls of the artery. These and the other principal points mentioned in this article, Professor Teissier confirms by a series of carefully-conducted experiments on animals.

As regards cerebral accidents due to using the negative pole in the sac, several were noted in the experiments referred to. When the needle placed in the vessel is in connection with the positive pole of the battery, the animal shows few signs of disturbance on closing the circuit; but on reversing the current, so that the needle in the vessel is no longer positive but negative, the animal is thrown into the greatest excitement, the muscles of respiration seem tetanised, the heart beats irregularly, and the arterial pressure, after rising slightly, falls considerably; the animal dies with tetanus of the fore limbs, stiffness of the neck, trismus, paralysis of the posterior half of the body, and anaesthesia of the opposite side. Examination reveals marked congestion of the medulla oblongata and pons

Varolii, and of the cerebral hemisphere corresponding to the vessel (the carotid) experimented on. To what were these changes due? Simply to the violence of the pain, the nervous commotion, or gaseous embolism? These questions have not yet been satisfactorily answered.

M. Teissier concludes with a full report of a case of large aortic aneurism, in which great benefit followed galvano-puncture by the method he recommends. This case, and the large number already recorded by M'Call Anderson, Dujardin-Beaumetz, Bucquoy, Proust, and others, he regards as proof of the correctness of his third proposition, that positive mono-puncture is sufficient for the attainment of the objects in view.

Anæsthesia of the Larynx by a New Method.—Dr. Rossbach, being dissatisfied with the ordinary method of producing local laryngeal anæsthesia by the administration of bromide of sodium, on account of the greater difficulty in operating when the patient is listless and drowsy under the influence of that drug, has of late followed another method, which he finds perfectly practicable and more convenient. His object is to influence the sensory portion of the laryngeal nerves, so as to interrupt conduction through them for a time, and thus induce complete anæsthesia of the larynx. The sensory portion of the superior laryngeal nerve is most easily reached at the point at which it passes through the thyro-hyoid membrane into the interior of the larynx, immediately below the extremity of the greater horn of the hyoid bone; here it is so superficial that a subcutaneous injection of about $\frac{1}{4}$ grain of morphia on each side, at the spot indicated, will produce full local anæsthesia. A simpler method of obtaining the same result is to direct the ether spray from a Richardson's apparatus on the above described points, which can be done on both sides simultaneously, with a double pointed nozzle; in one to two minutes complete anæsthesia is established.—(*Wiener Med. Presse.* No. 40. 1880.) *Cbl. f. Chirurg.* 13th November, 1880.

The Causes of Sudden Death.—These are grouped in a practical form, chiefly from a clinical point of view, by Dr. J. W. Hunt of Wolverhampton. Of cardiac cases, death from *asthenia* is the most important, and affords the greatest number of examples. It is caused by a paralysed and relaxed state of the heart's walls, and usually depends on a fatty degeneration (a true fatty metamorphosis) of the same, with

cardiac dilatation. There is the feeble cardiac impulse, the irregular and intermittent pulse, &c., indicative of the impaired muscular power of the heart till on some sudden demand, perhaps, on its strength, "it ceases in diastole, and the patient is dead." Our obvious duty in such a case is to guard against any sudden exertion. So, in dilatation of the heart, where the probable compensating hypertrophy is neutralised by further dilatation—the result of a secondary degeneration in common with the other tissues of the body. A similarly dangerous degeneration of the cardiac walls occurs in certain fevers, especially in diphtheria. Lenker has described two forms—a granular and a fatty. It is also met with in some non-febrile diseases, as delirium tremens, acute mania, tetanus, &c. Again, the heart may fail when it acts, so to speak, at a disadvantage, as in pericardial and pleuritic effusion. Valvular disease, particularly if it leads to aortic regurgitation, may paralyse the heart by over distension, when it will stop in diastole. The other mode of cardiac death is that from *anaemia*. Here the heart stops in systole, and is found firmly contracted after death. There may be no blood for the heart to propel, as in the rupture of an aneurism, or it may be drawn away from the heart, as occasionally happens in paracentesis of the peritoneum for large effusions, when the removal of the pressure leads to a sudden rush of blood to the part. Concluding this section with some remarks on *angina pectoris*, the writer passes on to cases in which the cause of death is in the lungs, producing *asphyxia*. Hæmoptysis, spasm of the glottis, &c., may produce death in this way. In embolism and thrombosis of the pulmonary artery, the asphyxia or apnæa is caused by an obstruction to the entrance of blood into the lungs, not, as in the former cases, from obstruction to the entrance of air. Really sudden death due to affections of the nervous system is rare. It is usually owing to a large amount of hæmorrhage in some important part of the brain, as the *pons* or *medulla*.

—*Birmingham Med. Review*.—April, 1880.—J. W. A.

Homatropin.—Some time ago Kraut and Lossen found that atropin may be split up into *tropin* and *tropic acid*, and last year Ladenburg succeeded in re-forming atropin from these two constituents. By treating the different salts of tropin with dilute hydrochloric acid, a class of alkaloids may be artificially produced, to which Ladenburg has given the generic name of *tropeins*; homatropin is one of the alkaloids so obtained,—by the action of dilute hydrochloric acid on amygdalate of tropin, the latter, singularly enough, being a

perfectly inert salt. Homatropin itself is not readily isolated ; its hydrobromate, however, is easily obtained, is very soluble, and is the preparation universally in use. On the pupil, hydrobromate of homatropin, when locally applied in solution (gr. 4 to $\frac{1}{2}$ i of water), acts more promptly than atropin ; it dilates the pupil to nearly the same extent, while its effects pass off very much sooner—in twenty-four hours at most. It is perfectly bland and unirritating to the eye, and has the further advantage of being much less poisonous than atropin. Like atropin, also, it paralyses and tetanises frogs ; it does not seem to act on the motor nerves or muscles, but rather on the nervous centres, especially the spinal cord. It paralyses the intracardiac inhibitory apparatus. Homatropin retards the heart's action ; subcutaneously injected, in man, in doses of $\frac{1}{10}$ to $\frac{1}{5}$ of a grain, it slowed the heart by 21 beats per minute on an average, and made its action somewhat irregular in force and rhythm, but produced no other effect, either on pupil, mouth, or throat ; in all these respects it differs from atropin. It antagonises muscaria. It antagonises pilocarpin also, arresting the sweating excited by that drug within ten minutes ; atropin acts similarly, and more promptly.—Mr. Tweedy and Professor S. Ringer, in *Lancet*, 22nd May, 1880.

Dr. W. Murrell has used homatropin (hydrobromate) for the night sweats of phthisis, giving it hypodermically in doses of $\frac{1}{10}$ to $\frac{1}{5}$ of a grain ; $\frac{1}{2}$ of a grain produced unpleasant effects, such as dizziness, a sickly sensation, and great disturbance of vision ; the effective dose was about $\frac{1}{10}$ grain. Dr. Murrell has given fifty of these hypodermic injections of homatropin to sixteen patients, and concludes that although the drug has undoubtedly the power of checking the hypersecretion, the results were not sufficiently satisfactory to justify the belief that it would rank high as a remedy for this distressing symptom. It is decidedly inferior to atropin, Dover's powder, picrotoxin, and other means at our disposal. Its price is at present prohibitive.—*The Practitioner*. October, 1880.

Pilocarpin in Diabetes.—Dr. L. v. Hoffer records (*Mitt. d. Steyerischen ärztl. Vereins* xvi, p. 113) a case of diabetes in which the subcutaneous injection of pilocarpin ($\frac{1}{2}$ grain) was followed by marked improvement, a circumstance which is interesting when viewed in connection with the similarly successful results obtained from somewhat similar treatment, by Professor Charteris, in the Royal Infirmary (see *Lancet*, September 1880.) The patient was a man aged 27. The pilocarpin, in producing its well known physiological effects,

profuse perspiration and salivation, also very rapidly diminished the quantity of urine, and the amount of sugar excreted, while corresponding improvement in the general condition was observed. Neither the sweat nor the saliva contained sugar. The diminution in the flow of urine lasted for several days after each injection.—*Cbl. f. d. Med. Wiss.* 16th October, 1880.

Salicylic Acid in Mixture.—An impression prevails that salicylic acid, when combined with an acetate (such as acetate of potash), takes the place of the acetic acid in the salt, setting this acetic acid free. But it appears from recent investigations by R. Schulze (*Jour. f. Pract. Chemie.* II, 21, pp. 380-382) that this is not the case. In order to ascertain what substances combine with salicylic acid, this author treated solutions of a great many substances with given weights of the acid, and then determined the amount of free acid present. The experiments showed that, of nitrogenous bodies, only gelatine and urea combine with salicylic acid, and in the case of salts, that *only the sodium and ammonium salts of acids having weaker acid properties than salicylic acid can combine with it.* Potassium and calcium salts do not combine at all with salicylic acid.—*New Remedies.* October, 1880.

Topical Medication of the Uterus.—The subject of intra-uterine medication, more especially as connected with the treatment of fibrous tumour of the womb, is fully discussed by Dr. A. Tripier in the *Bull. Gén. de Thérap.*, 15th October, 1880. He declares himself in favour of fluid injections carefully administered, and believes that many of the accidents reported are due to faults on the part of the operator, and to the prolonged use of the speculum. The injection should be small in quantity, whatever substance is used, and its ready return through the cervical canal should be ensured. The best cannula is a rigid catheter with a flexible sound; and no speculum should be employed, or only that of Récamier. Injections must not be practised if there be any inflammation going on, accompanied by fever. In making selection of a topical agent it must be borne in mind that the uterus is very tolerant of some substances and very intolerant of others; on the whole, however, it bears local treatment better than might have been expected.

Vidal's injection, a watery solution of iodine and iodide of potassium, produces no remote bad effects, but causes great pain. The author at one time used, and very successfully,

a paste composed of one part of tannin to nine of paraffin; this was injected through a sound furnished with a piston, and gave good results, especially in uterine catarrh. But paraffin does not mix well with metallic salts or with vegetable extracts. Pomades made with lard are very readily prepared; but when tried it was found that they, and even pure lard, caused great pain, and sometimes fever and meteorism. Glycerine, used as a basis, as in glycerine of tannin, 1-10, gives rise to still more pain than fatty preparations. Water, fat, and glycerine, therefore, besides being objectionable in themselves, give up the active ingredients incorporated with them too readily, and the womb is thus acted on with too great violence. As the result of numerous experiments, Dr. Tripier finds that soap is much the best vehicle for such remedies, as it is well borne by the uterus and is miscible with most medicines. He employs sometimes the white Marseilles soap, at other times ordinary almond soap; this is made into small *crayons*, each of which contains a fixed quantity of the remedy used. The iodide of potassium, chlorate of potash, sulphate of copper, carbolic acid, the salts of zinc and iron, chromates, sulphates, &c., may all be applied locally in this way; but it is for the topical use of the alkaloids, such as morphia, conia, digitaline, aconitine, atropia, and quinine, that this agent is best fitted. Morphia and conia will be found serviceable in cancer, digitaline and aconitine in inflammatory affections, atropine in some forms of dysmenorrhœa, and quinine in some reflex neuralgic affections of periodic character. Before introducing the crayons the uterine sound should be passed, then a hollow sound containing the crayon, which is expelled by the piston and left in the uterine cavity.

Treatment of Morbid New Formations with Wickersheimer's Fluid.—P. Vogt recommends this fluid (described in this *Journal*, August, 1880, p. 169) in the treatment of malignant growths which cannot be operated upon. He reports no "cures" brought about by this means, but believes that the preparation, when the new growth is impregnated with it, will prevent the extension of malignant tumours and their propagation, by imbibition or otherwise, to other parts of the body. The author uses the fluid in various ways—by injection into the substance of the growth, half a Pravaz' syringeful being introduced at a time; by painting it on the surface of the tumour; by wet dressings dipped in the solution; and by passing woollen threads, soaked in the fluid, through the base of the growth. The total quantity used in the 24 hours

amounted to 2-3 grammes. As possibly explaining the action of Wickersheimer's fluid, it is to be borne in mind that it contains a small proportion of arsenic—4 mgr. in every gramme.—(*Cbl. f. Klin. Chir.*, xxv, p. 615). *Cbl. f. d. Med. Wiss.* 20th November, 1880.

Craniotomy.—Professor R. J. Kinkead, at the March meeting of the Dublin Obstetrical Society, discussed the subject of craniotomy and its alternatives. He concluded that the Caesarian section, undertaken early, is, for the mother, quite as safe as craniotomy, and spares a large number of children. He combated the common idea that the life of the mother is more valuable than that of the child. "It appears to me that the question of the value of one life over that of another cannot be entertained." He advised Caesarian section early in labour; but, if much time had already been lost, either laparo-elytrotomy or Porro's operation for removal of the uterus. There being thus three alternatives to embryotomy, it was urged that practitioners should seriously consider the question, and seek to get rid of "the only operation recognised and sanctioned by the British profession which is undertaken with the avowed intention of destroying life."—*Obst. Jour.* October, 1880.—W. L. R.

Treatment of Purulent Discharge from the Ear by the Insufflation of Borax.—Dr. Todd states that, having given up the old system of treatment by syringing the ear with various washes, he has been much pleased with the success he has attained by treatment with powdered borax. The constant presence of the discharge causes the tissues to become macerated, a change favoured by frequent washing; borax, on the other hand, acts as an absorbent, and helps to dry up the tissues, while it discourages suppuration. He puffs it in through a tube in considerable quantity, and washes out the ear at long intervals, taking care to cleanse it thoroughly with absorbent cotton. This method of treatment seems also to be gaining ground in this country.—*St. Louis Courier of Medicine.* August, 1880.—G. S. M.

Alterations in the Blood in Disease.—As the result of a series of experiments, Dr. Quinquaud has been led to the following conclusions:—1. In a state of health there is a small quantity of the haemoglobin of the blood *inactive*. 2. In fevers, this inactive portion absorbs oxygen, and becomes active. 3. In certain diseases the haemoglobin becomes inert,

e.g., in the last stage of confluent small-pox, croup, cholera, peritonitis, &c. In such cases there is either cyanosis or the expression of asphyxia. Here the haemoglobin absorbs much less oxygen, becomes in great part inactive, and then inert. 4. The haemoglobin can undergo such a change as that it leaves the blood corpuscles and makes its way through the blood-vessels into the tissues. The various hemorrhages arise in this way. The principal cause of this dissolution of the active matter of the corpuscle appears, from analysis, to be a mineral lesion of the corpuscles and blood plasma. In such conditions the white corpuscles are also altered.—*Gazette des Hôpitaux*. 11th September, 1880.—J. W. A.

Effect of Venesection on Inflamed Tissues.—To demonstrate the effect of abstraction of blood on inflamed parts, Dr. E. Maragliano, Professor of General Pathology in Genoa, performed the following experiments:—The web of the foot of a curarised frog was placed under the microscope, and rubbed over with dilute croton oil; as soon as the signs of inflammation were noticed (stagnation and aggregation of the red corpuscles in the capillaries, arrangement of the white corpuscles along the venous wall), the crural vein of the other leg was opened, and a considerable quantity of blood allowed to escape. The inflammation, judged by microscopic observation, was not arrested by this proceeding; it rather became worse, and soon there was complete stasis of the circulation in the affected part. The experiment was repeated on a rabbit's ear, but in this case the blood was abstracted by leeches placed at the root of the affected ear. The result was similar; the inflammation increased in intensity, and entered more slowly on resolution than in those instances in which no bleeding was practised. The author concludes, therefore, that the abstraction of blood, either generally or locally, rather aggravates than mitigates the inflammatory process.—*Cbl. f. d. Med. Wiss.* 20th November, 1880.

Influence of Tobacco on the Physiological Functions of the Uterus.—Dr. Ygonin denies that tobacco is hurtful to those women engaged in its manufacture, and bases his views on his experience in the factories of Lyons. The women employed in these factories menstruate, as a rule, regularly and naturally, and do not appear to abort or miscarry oftener than other women; nor are their children more subject than other children to the diseases of early life.—*Lyon Médical*. 21st November, 1880.

Artificial Inflation as a Remedial Agent in Diseases of the Lungs.—In a paper by Dr. Gadbury, Yazoo city, read by Dr. J. Solis Cohen (author of a well known work on *Diseases of the Throat*) before the American Medical Association at New York, June, 1880, this method of treatment is brought before the profession as being one of great value in many cases. Dr. Gadbury had been impressed with the expensiveness and inconvenience of the apparatus recommended by those who have advocated the employment of condensed and rarefied air in pulmonary cases, and by the fact that the intervals between the applications were too long to accomplish the desired effect. Accordingly, he improvised an instrument by detaching the spray tubes from a Richardson's hand bulb and atomiser, and inserting in their place a mouth tube. He employs it as follows:—"The patient, having dilated his lungs to their greatest capacity by a forced, voluntary inspiration, immediately compresses the nasal passages with one hand, while he presses the tube of the compressor between his lips with the other, then closes the lips gently upon it, and rapidly works the compressor. A few squeezes pump an intermittent current of compressed air into the lungs, and as soon as the distension becomes unpleasant, or the need of an expiratory movement is required, the instrument is withdrawn, to be replaced and re-employed in the same manner a few moments subsequently, the operation being repeated four or five times in succession." In a healthy subject the operation is painless, but to a person with diseased lungs it is at first disagreeable and sometimes painful. After frequent use it affords great comfort to those who suffer from a feeling of suffocation, and have diminished capacity of these organs.

He reports several cases in which it had been continuously employed for long periods. One case, when at his worst, spending most of the day in inflating his lungs until he had so far arrested the progress of phthisis as to have regained his normal weight, and to be able to do his full day's work as in health. Dr. Gadbury offers the following explanation of the action of inflation:—"Inflation forces fresh air into the lungs, expanding unused capillary tubes and air cells; displaces the residual air and noxious gases; excites cough and expectoration, which removes morbid secretions at once, thereby lessening the danger of infection from unhealthy accumulation; and obviates the necessity for expectorant medicines, which often disturb the digestive organs; oxygenates the blood; promotes absorption, relieves dyspncea, gives impetus to pulmonary circulation, reduces temperature in fever, and

dessicates the fluids in the air passages." "Beneficial results may be derived from it in croup, diphtheria, bronchitis, asthma, tuberculosis, whooping-cough, asphyxia, chloroform poisoning, shock, foreign bodies in the air passages, and many other obstructive lesions of the pulmonary organs."

At Dr. Gadbury's suggestion, Dr. Cohen has given this method a trial for a year, both in hospital and in private practice, and he gives a preliminary report of his experience. He considers that "it cannot be safely employed in all cases in which insufflations of compressed air, as supplied from the apparatus of Waldenburg and others, are applicable; but it has a sufficiently wide range of utility to commend it to professional attention; and in a certain class of cases, it is of greater service than the bulky machines alluded to." The instrument is meant to be used by the patient himself, but is apt to be too powerfully exercised in cases liable to haemoptysis, and in certain cardiac and visceral disorders; hence in these instances Dr. Cohen would not entrust it to the patient. But he looks upon this method as of great value as a mechanical expectorant, and strongly recommends it to the profession. "Time and again I have placed the little compressor in the hands of a patient with bronchioles and air cells clogged with pus and mucus, to see its use immediately followed by copious expectoration, to the great comfort of the patient. The process is repeated until it ceases to be followed by expectoration, and there is absolute or relative relief from the desire to cough. . . . The hyper-distension of the air cells permits the access of air under pressure to points beside and beyond the masses of mucus clinging to the walls of the bronchioles and alveoli, and excites effective cough. Several of my consumptive patients clear their passages out at bedtime in the manner indicated, and secure a good night's rest, free from disturbance by cough. When they rise to dress, they clear the parts of the over-night accumulation in like manner, and attack their breakfast with relish."

Neither Dr. Gadbury nor Dr. Cohen seeks to offer this method of treatment as a cure for phthisis, but, having seen its beneficial results as an expectorant, they have recorded their experience, "for the purpose of drawing attention to this simple and inexpensive contrivance, and of having its merits tested on an extended scale."—*St. Louis Courier of Medicine.*
August, 1880.—G. S. M.

Explosive Combinations.—Several combinations of a dangerous character were noticed in the January number of

this *Journal*, 1879. To these the following, extracted from the *Bull. Gén de Thérap.*, 15th October, 1880, should be added.

1. Hypophosphite of lime, chlorate of potash, and lactate of iron, when mixed in the dry state, exploded violently.
2. A solution of four parts of chromic acid in eight of glycerine also exploded.
3. Chlorate of potash, mixed with a dentifrice, in the form of a dry powder, and used with a dry brush, will give rise to explosions even in the mouth.
4. Pills composed of permanganate of potash and extract of yarrow, or of the same salt with reduced iron, or of sulphurated antimony and chlorate of soda, are apt to deflagrate during or after preparation.

It follows from these facts that glycerine, and in general all such reducing agents, should never be combined with oxidising agents such as chromic acid, the chlorates, permanganates, and certain organic acids.

Vascular Hydrosis as a Prophylactic to Poisonous Absorption.—In this paper, Mr. L. Maturin proposes that, in cases of poisoning resulting from snake and dog bites, dissection wounds, and vegetable and mineral poisons, distilled water at a temperature of 98° Fahr. should be injected into the veins by means of an ordinary syringe or transfusion apparatus. This suggestion is based upon the fact that absorption takes place much more easily and rapidly after the body has sustained a loss of blood, as may be observed in the increased susceptibility to puerperal septicæmia after uterine haemorrhage; this being the case, why should the converse not be true also—viz., that in repletion of the circulation, absorption should be arrested and reduced to a minimum? In addition to the venous injection, cold astringent fluids should be injected into the stomach as a counter-absorbent.—*Dublin Journal of Medical Science*. August, 1880.—J. C. R.

Peptonised Milk as Food for Infants and Invalids.—Dr. R. J. Nunn recommends this preparation above every other for these purposes. The following are the directions for making it:—To one pint of milk at 80° F. add a teaspoonful of rennet solution, or ten grains of pepsin, and keep the mixture at 80° F.—never at a higher temperature. When coagulation is complete, but before the whey has begun to separate, beat the whole up smooth with a whisk or beater,

and pass it through a fine milk strainer to insure the minute division of the curd. This keeps as well as new milk, and will remain unchanged for twenty-four hours if kept cool. When given it should be diluted just like milk, and it is often advantageous to add a little sugar of milk, and lime water. As an infant diet, Dr. Nunn has found nothing equal to this, both in health and in disease, as in diarrhoea, cholera infantum, and wasting diseases. In the treatment of consumptives, also, and of dyspeptics, it is particularly valuable. A cream peptone may be made by treating cream in the manner just described. Either of these preparations may be frozen, and given as an ice cream. Koomiss peptone is prepared by mixing one pint of milk peptone, made as above directed, with 1-2 ounces of sugar and 1-2 fluid ounces of brandy or other spirit; this mixture should be put into a gazogene and charged with carbonic acid gas. It may be drawn off as needed for use.—*American Journal of Obstetrics.* July, 1880.

Scillaïne.—M. V. Jarmerstedt proposes this name for a new alkaloid extracted from squills, of which it is the principal active constituent. It is pale yellowish in colour, odourless, bitter, slightly soluble in water, ether, and chloroform, but very readily dissolved by alcohol. Heat transforms it into a resinous mass. It has not yet been used in practice, but experiments on animals have shown that in large doses it causes diarrhoea and vomiting, and that it has a special action on the heart. At first it increases the blood pressure and lessens the frequency of the pulse; subsequently it lowers the blood pressure and quickens the pulse. The fact that its physiological effects are thus precisely those of digitaline might lead to the conclusion that the diuretic action of squills is produced only when the urinary difficulty is connected with some affection of the circulation; but as this is opposed to clinical experience, it is probable that there remain other alkaloids in squills yet to be discovered. (*Arch. f. Exp. Path. u. Pharm.*) *Bull. Gén de Théráp.* 15th October, 1880.

Treatment of Rodent Ulcer of the Cornea.—Dr. Sikora holds that this form of corneal ulceration is specific in character, infectious, and septic in origin, and that it inevitably ends in perforation and destruction of the cornea. The only treatment which suffices to arrest its progress is the transverse incision recommended by Professor Scemisch; if performed in time this operation checks the extension of the ulcerative process, and cicatrisation rapidly follows, no indelible mark

being left. The point of the knife is made to enter the cornea, and is carried into the anterior chamber at about 1 mm. to the side of the ulcer, emerging at about the same distance on its farther side; the whole floor of the ulcer is then divided by cutting outwards. This operation gives perfect results when the ulcer is central, when there is no adhesion of the iris to the crystalline lens, and when the incision required does not exceed in length the radius of the cornea; but it must be performed in time, as soon as the nature of the case is recognised. More extensive ulceration of this character must be treated by iridectomy or sclerotomy. (*Thèse de Paris.*) *Bull. Gén. de Théráp.* 15th October, 1880.

Neuralgia of the Testis.—In a paper read before the New York Neurological Society, Dr. W. A. Hammond details two cases successfully treated by forcible compression of the spermatic cord. The relief afforded in each case was prompt and decided. Pressure was applied by means of an apparatus similar to a lemon squeezer. To be effectual in relieving the pain of a neuralgic testis, the pressure must be strong enough to break up the axis cylinders of the nerves.—*Dublin Journal of Medical Science.* September, 1880.—J. C. R.

The Alkaloids of Jaborandi Leaves.—A careful examination of jaborandi has convinced Drs. Harnack and Meyer (*Liebig's Annal. d. Chem.*, 204, 67) that this drug contains at least two alkaloids, *pilocarpin* and another which they propose to name *jaborin*. The former they show to be entirely analogous to nicotine in its effects, while the latter, an uncrystallizable alkaloid easily obtained from the ordinary commercial pilocarpin, corresponds in action with atropine. The two alkaloids also differ strikingly in chemical characters and in solubilities. The best test for the presence of *jaborin* in any preparation of pilocarpin is the physiological trial on the frog's heart, as *jaborin*, like atropine, paralyses the cardiac terminations of the pneumogastrics, the action of the pilocarpin on the frog's heart being overborne by that of the *jaborin*. These statements furnish an explanation of many paradoxical observations recorded with regard to the action of jaborandi.—*New Remedies.* November, 1880.

Morphia in Epilepsy and Puerperal Convulsions.—Dr. C. C. P. Clark holds that in these two diseases the condition of system is substantially identical. For their treatment he strongly recommends morphia hypodermically, in large doses,

the nervous system being in these affections strangely tolerant of opiates. The epileptic fit may be prevented if, as soon as the premonitory symptoms are observed, $1\frac{1}{2}$ grain of morphia be injected, a quantity which should be repeated in two hours if necessary. The same dose should be given on the first appearance of the signs of puerperal convulsions, and should be repeated in two hours, or in at longest eight hours if labour have come on. Dr. Clark says that he has never seen this treatment, promptly and boldly carried out, fail to ward off eclampsia when it seemed to be threatened; that he has many times seen it obviously put a stop to the paroxysms after they had commenced; and that he had never seen a patient die of the disease when the medicine had been administered in season, in sufficient quantity, and in the proper manner.—*American Journal of Obstetrics.*—July, 1880.

Tartaric Acid in Diphtheria.—Vidal, in order to prevent contagion, considers the local treatment of diphtheria as very important. For this purpose he has used tartaric acid for a long time; his formula is as follows:—Tartaric acid, 10 parts; peppermint water, 25 parts; and glycerine, 15 parts. This is said to destroy the pseudo-membrane, and to act well as a local remedy; but general treatment cannot be dispensed with.—(*Deutsch. Med. Zeit.*) *New Remedies.* November, 1880.

Treatment of Fissure of the Anus.—This painful and obstinate affection may, according to M. G. Glénereau, be readily cured by attention to the following line of treatment:—Every evening, at bed time, the patient takes 3 grammes (about 45 grains) of calcined magnesia. In the morning he seats himself over a vessel containing a warm decoction of belladonna, which must be renewed as fast as it cools. The patient then wraps himself in a heavy blanket, to keep in the vapour, and makes repeated efforts to relieve the bowels; if these produce much pain he desists, and waits for a short time, then tries again and again, till soon he finds that the agonising pain so characteristic of this disease has disappeared. He then proceeds to the water-closet, and generally succeeds in obtaining an easy, painless motion. When the bowels have been cleared, a piece of lint soaked in an ointment, consisting of plain butter ointment, 3iiss, extract of belladonna, grs. iii, and oil of sweet almonds, a sufficiency to bring the mass to the necessary fluid consistence, should be placed within the anus in such a way as to enter and cover the fissure. If the lint slips out during the day,

another piece should be introduced at night; it must be removed in the morning, however, that the anus may be fully exposed to the vapour. After the fourth day the magnesia may be omitted, and after the tenth the strip of lint; treatment may usually be stopped at about the end of the third week.—*Bull. Gén. de Thérap.* 30th September, 1880.

Pathology and Treatment of Hooping-Cough.—By R. Meyer-Hüni. *Zeitschr. f. Klin. Med.*, I, p. 461.—As the result of prolonged and careful study of a large number of cases, the author has come to the conclusion that hooping-cough is an infectious disease of the whole primary respiratory tract, from the mouth down to the smaller bronchi. The spasmodic attacks of coughing are usually excited by the presence of a pellet of mucus on the exceedingly sensitive inter-arytenoid mucous membrane. Therapeutically, quinine is disappointing, whether given inwardly or applied locally. The application of astringents (powdered alum, or a 1-2 per cent solution of nitrate of silver) gives better results, especially in adults; in children astringent inhalations are particularly recommended. Great importance is attached to the keeping the nasal passages clear with douches, &c. No benefit was obtained from morphia in children; belladonna, however, in the form of sulphate of atropine (a quarter of a milligramme, 2-4 times daily) proved of great service.—*Cbl. f. d. Med. Wiss.* 18th September, 1880.

State of the Ganglionic Centres in Bright's Disease.—Drs. Da Costa and Longstreth present here the results of a four years' investigation of the pathology of Bright's disease. They began their researches impressed with the view that as this disease is one in which great alterations in the vessels and in the vascular supply, not only of the urinary secreting organs, but of the whole body, exist, some morbid condition ought to be met with in the nervous arrangements that have for their chief office the regulation of the blood supply; a view which was strengthened by reflecting on the fact that kidney disease is always both sided, and on the nervous phenomena so often associated with the affection. This record embodies a full account of nine cases of renal disease in which a careful microscopic examination of the parts, especially the renal ganglia of the sympathetic, was made, the general result being that in every instance ample evidence of grave anatomical change was found in these structures.

The nature of the alteration varied to some extent, and led to

the arrangement of these nine cases into three classes. In the first there were very marked accumulation of fat round the kidneys and ganglia; thickening of the capsule and abundant hyperplasia of the connective basis substance of the ganglia, which had apparently passed through the active stage, and was undergoing contraction; extreme fatty degeneration and atrophy of the ganglion cells, those bodies sometimes forming yellow spots without definite structure, sometimes appearing as areas filled with large oil globules, destitute of nuclei or nucleoli; complete transformation into a granular and fatty mass, of small areas of the ganglia, including both ganglion cells and connective tissue; thickening of the walls of the ganglionic blood-vessels, hypertrophy of their muscular coat, increase of the surrounding connective tissue, with collapse and closure of their lumina.

In the second group of cases the adipose and connective tissues round the ganglia and kidneys showed similar changes to those noted in class I. The ganglia were strikingly altered and degenerated, but also to a different degree, showing irregularity of outline, shrivelling, and abundance of fatty and granular matters, and some pigment granules. But the most striking difference was noticed in the condition of the connective tissue basis substance of the nervous masses; this tissue was filled to a greater or less extent with small cellular elements, having the usual characters of connective tissue elements, and presenting themselves as round nuclear bodies or spindle-shaped cells. Vessels in and round the ganglia were very numerous.

In the third group a still less advanced type of disease was encountered. The changes in and about the ganglia were much less marked, and in some cases were inappreciable; increase of connective tissue and accumulation of fat round the ganglia and kidneys were prominent conditions; the ganglion cells were markedly granular, but showed no trace of fatty degeneration. The connective basis substance exhibited recent hyperplasia, which corresponded with the recent or slightly marked changes in the ganglion cells, and with the type of renal disease in this group generally. There was also a similarly increased degree of vascularity in and round the ganglia.

The authors regard these changes as standing distinctly in a causal relation to the kidney disorder. They hold that the specific cause of the affection, whatever may be its unknown form or character, acts first on the ganglion cells, and that through these cells presiding as centres of innervation to the

kidneys, and controlling the renal blood-vessels, the state of contraction of the muscular coat of the vessels of the kidneys is altered, and probably also the conditions of osmotic action between the blood and renal tissues affected ; this they believe to be the manner in which the collective phenomena known as Bright's disease are brought about. The conclusions in which they sum up their work are :—

1st. That in Bright's disease, especially in the contracting kidney, there exists a constant lesion of the renal plexus.

2nd. That whilst this lesion might be looked upon as forming part of a general process of degeneration, in connection with the kidney disease, we think it is the cause of the renal malady, and precedes the degenerative changes.

3rd. That the diseased condition of the ganglia furnishes the clue to the alterations of the vessels of the kidneys.

4th. That similar changes producing similar results may exist in other ganglia ; for instance, in the cardiac plexus, explaining the hypertrophy of the heart.—*American Journal of the Medical Sciences.* July, 1880.

Books, Pamphlets, &c., Received.

- The Descriptive Atlas of Anatomy. A representation of the Anatomy of the Human Body. In 93 Royal 4to Plates, containing Five Hundred and Fifty Figures. London : Smith, Elder & Co. 1880.
- Surgical Lectures, delivered in the Theatre of the Westminster Hospital. By Richard Davy, M.B., F.R.C.S., Surgeon to the Hospital. London : Smith, Elder & Co. 1880.
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